Note remarks

Test sheet : VOL 10,0 y1 Edition : 02.10.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 903

Injection pump

Pump designation: PE6P110A320RS3080-5

EP type number : 0 411 816 767

Governor

Governor design. : RQV250...950PA921-19

Governer no. : 0 421 813 802

Customer-spec. information

: VOLVO-TRUCK Customer

: TD102FM Engine

1st version kW : 235.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 : (2.95...3.15) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 19.6...19.8

100 s: (19.4...20.0)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 3.7...3.9

Del.quantity cm3/: 1.2...1.6

100 s: (0.9...1.9) cm3 : 0.3 Spread

100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.00...1.40 travel mm

rpm : 350 2nd speed

: 2.20...2.80 travel mm

rpm : 750 3rd speed

: 6.30...6.70 travel mm

4th speed rpm : 995

: 8.20...8.40 travel mm

5th speed : 1060 rpm

: 9.30...9.70 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1000

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 196.0...198.0 1000 : (194.0...200.0)

cm3: 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version Control Lever

position degrees: 61...69

Testina:

1st rack travel in: 12.20 rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1250 Speed rpm: 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 4...12

Testing:

Speed rpm : 100 Minimum rack trave: 5.30 Speed rpm : 250 Rack travel in mm : 3.70...3.90

CONSTANT REGULATION

rpm : 250...360 Speed

Aneroid/Altitude Compensator Test

1st version Settina

: 500 Speed rpm hPa : 900 Pressure

: 13.20...13.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.10

2nd pressure hPa : 90

Rack travel in m: 10.20...10.30

3rd pressure hPa : 680

Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 134.5...136.5 1000 s: (131.5...139.5) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.20

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 160.0...190.0 1000 s: (156.0...194.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm

Rack travel in mm : 3.70...3.90 Del.quantity cm3/: 12.0...16.0

1000 s: (9.5...19.5)

cm3 : 3.00 Spread

1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

mm

Note remarks

: DAF 8,3 p 2 : 02.10.89 Test sheet Edition : 28.6.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 846 905

Injection pump

Pump designation : PE6P110A720RS3225-1

EP type number : 0 411 816 762

Governor

Governor design. : RQ250/1200PA913 Governer no. : 0 421 801 477

Customer-spec. information Customer : DAF

Engine : HT 168

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2-

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0
Rack travel in mm : 7.2...7.4
Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1) cm3 : 0.4

Spread 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 550 Speed Rack travel in mm: 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

Del.quantity : 120.0...122.0 1000 : (117.5...124.5)

cm3: 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 15.8

Testing:

1st rack travel in: 11.40

rpm : 1235...1250 Speed 2nd rack travel in: 4.00 Speed rpm: 1325...1355

4th rack travel in: 1400

rpm : 0.00...1.40Speed

LOW TOLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm: 5.8 Testina: : 100 Speed rpm Minimum rack trave: 8.00 rpm : 250 Speed Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00 : 330...370 Speed rpm TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.70...12.80 2nd speed rpm : 1200 Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 1000 Pressure : 12.40...12.50 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 83.5...85.5 1000 s: (81.0...88.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1235...1250 Speed

: 250

rpm

LOW IDLE

Speed

A04

Rack travel in mm : 5.70...5.90
Remarks:

Note remarks

Test sheet : DAF 8,3 p 5

**Fdition** : 09.11.89

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 905

Injection pump

Pump designation : PE6P110A720RS3225Z

EP type number : 0 411 816 762

Governor

Governor design. : RQ250/1200PA913

: 0 421 801 477 Governer no.

Customer-spec. information

: DAF Customer

: HT 168 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-Firing order

: 0-60-120-180-240-300 Phasing

BASIC SETTING

rom: 1000 1st speed

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed

Rack travel in mm : 7.2...7.4 Del.quantity cm3/ : 1.4...1.9 100 s: (1.1...2.1)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm: 550 Rack travel in mm: 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

Del.quantity : 120.0...124.5)

: 4.00 cm3

Spread 1000 : (7.50)

RATED SPEED

1st version

Setting point:

rpm : 550 Speed Rack travel in mm: 15.8

Testing:

1st rack travel in: 11.30

Speed rpm: 1235...1250 2nd rack travel in: 4.00

Speed rpm : 1300...1330 4th rack travel in: 1400

rpm : 0.00...1.40Speed

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 5.8 Testing: rpm : 100 Speed Minimum rack trave: 8.00 : 250 Speed rpm Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00 rpm : 320...360 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.60...12.70 2nd speed rpm : 1200 Rack travel in m: 12.50...12.70 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : 1000 Pressure Rack travel mm : 12.30...12.40 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 83.5...85.5 1000 s: (81.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30

full load rack tr: 11.30 Speed rpm : 1235...1250

LOW IDLE

Speed rpm: 250

A06

Rack travel in mm : 5.70...5.90

Remarks:

•

Note remarks

: DAF 8,3 p 3 : 02.10.89 Test sheet Edition : 23.6.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 846 906

Injection pump

Pump designation: PE6P110A720RS3225-1

: 0 411 816 762 EP type number

Governor

Governor design. : RQV250...1200PA910

: 0 421 813 746 Governer no.

Customer-spec. information : DAF Customer

Engine : HT 200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. . C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \dots : 0.50 (0.75)$ 

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 250.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/ : 1.4...1.9 100 s: (1.1...2.1)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm

rpm : 450 2nd speed

: 2.90...3.30 travel mm

rpm : 800 3rd speed

: 4.70...5.10 travel mm

rpm : 1200 4th speed

: 7.80...8.00 travel mm

rpm : 1500 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1235 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELTY. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1000

: 120.0...122.0 Del.quantity 1000 : (117.5...124.5)

: 4.00 Spread cm3

: (7.50) 1000

RATED SPEED

1st version

Control lever position degrees: 50...58 Testina: 1st rack travel in: 11.40 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 Speed rpm : 1335...1365 4th rack travel in: 1450 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 13...21 Testing: Speed : 100 rpm Minimum rack trave: 8.00 : 250 Speed rom Rack travel in mm : 5.70...5.90 CONSTANT REGULATION rpm : 280...400 Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom hPa : 1000 Pressure : 12.40...12.50 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 83.5...85.5 1000 s: (81.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than

full load rack tr: 11.40

**80A** 

Speed rpm : 1240...1250

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.70...5.90

Remarks:

.....

Note remarks

Test sheet : DAF 8,3 p 6 : 09.11.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 906

Injection pump

Pump designation : PE6P110A720RS3225Z

: 0 411 816 762 EP type number

Governor

Governor design. : RQV275...1200PA910

: 0 421 813 746 Governer no.

Customer-spec. information

: DAF Customer

Engine : HT 200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 12.0...12.2

100 s: (11.7...12.4)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 275.0 Rack travel in mm : 7.2...7.4

Del.quantity cm3/: 1.4...1.9 100 s: (1.1...2.1)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm

rpm : 450 2nd speed : 2.90...3.30 travel mm

rpm : 800 3rd speed

: 4.70...5.10 travel mm

rpm : 1200 4th speed travel mm : 7.80...8.00

: 1500 5th speed rom

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1235 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

: 120.0...122.0 Del.quantity 1000 : (117.5...124.5)

cm3 : 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version

Control lever position degrees: 50...58 Testing: 1st rack travel in: 11.30 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 Speed rpm : 1335...1365 4th rack travel in: 1450 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 13...21 Testina: : 100 Speed rpm Minimum rack trave: 8.00 Speed rpm : 275 Rack travel in mm : 5.70...5.90 CONSTANT REGULATION rpm : 280...400 Speed Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed MCT hPa : 1000 Pressure Rack travel mm : 12.30...12.40 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...10.90 2nd pressure hPa : 395 Rack travel in m: 12.00...12.10 3rd pressure hPa : 320 Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 83.5...85.5 1000 s: (81.0...88.0) BREAKAWAY 1st version 1mm rack travel less than

rpm : 1240...1250 Speed

LOW IDLE

Speed rpm : 275 Rack travel in mm : 5.70...5.90

Remarks:

A10

full load rack tr: 11.30

### Note remarks

Test sheet : MB 11,0 l 5
Edition : 06.10.89
Replaces : 3.7.89
Test oil : ISO-4113

Combination no. : 0 401 846 907

Injection pump

Pump designation: PE6P120A320LS3815-13

EP type number : 0 411 826 782

Governor

Governor design. : RQV350..1050PA925 Governor no. : 0 421 813 764

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 441 A

1st version kW : 191.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70

: (3.55...3.75)
Rack travel in mm : 9.00...12.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

Spread cm3:0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 4.6...5.2 Del.quantity cm3/ : 1.4...2.2

100 s: (1.1...2.5)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.40...1.60

2nd speed rpm: 800

travel mm : 4.70...5.10

3rd speed rpm : 1100

travel mm : 7.60...8.20

4th speed rpm : 1175

travel mm : 9.20...9.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm: 1080

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1050

Aneroid pressure h: 900 : 188.0...190.0 Del.quantity 1000 : (185.0...193.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 60...68 Testing: 1st rack travel in: 10.70 rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1150...1180 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 10...14 Testing: : 250 Speed rpm Minimum rack trave: 8.00 rom Rack travel in mm : 4.60...5.20 CONSTANT REGULATION rpm : 350...550 Speed TORQUE CONTROL Dimension a mm : 1.30 Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 11.70...11.90 2nd speed rpm : 950 Rack travel in m: 12.40...12.60 3rd speed rpm : 850 Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : 9.30...9.50 Rack travel mm Measurement 1/min: 500 Speed

1/min: 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 rpm : 800 Speed Del.quantity cm3/: 211.0...215.0 1000 s: (208.0...218.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 900 rpm : 1050 Speed Del.quantity cm3/: 155.0...157.0 \* 1000 s: (152.0...160.0) Spread cm3 1000 s: (12.0) Aneroid pressure h: rpm Del.quantity cm3/: 127.0...129.0 1000 s: (124.0...132.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1090...1100 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0) Remarks: \* = Set at reduced-delivery stop.

START CUT-OUT

1st pressure hPa : 400

2nd pressure hPa : 600

Rack travel in m: 10.10...10.30

Rack travel in m: 11.70...12.10

Note remarks

: MB 11,0 s17 : 15.08.89 : 23.6.89 Test sheet Edition Replaces Test oil : ISO-4113

Combination no. : 0 401 846 909

Injection pump

Pump designation: PE6P110A320LS3835-2

: 0 411 816 761 EP type number

Governor

Governor design. : RQV350...1050PA378-

10

: 0 421 813 765 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM 441 Engine

1st version kW : 160.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ., .: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 13.8...14.0

100 s: (13.5...14.2)

Spread cm3 : 0.4

100 s: (0.8)

rpm : 350.02nd speed

Rack travel in mm : 7.8...8.2 Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.0)

cm3 : 0.4Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 travel mm : 1.10...1.30

2nd speed rpm : 500

: 3,50...3.80 travel mm

3rd speed rpm : 1100 : 8.00...8.50 travel mm

: 1150 4th speed rpm

: 9.20...9.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 138.0...140.0 Del.quantity

1000 : (135.5...142.5)

cm3 : 4.00 1000 : (8.00) Spread

RATED SPEED

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 11.90 rpm : 1090...1100 Special

2nd rack travel in: 4.00

Speed rpm : 1135...1165 4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 11...19

Testing:

: 200 Speed rpm Minimum rack trave: 9.50 Speed : 350 rpm

Rack travel in mm : 7.80...8.20

CONSTANT REGULATION

rpm : 350...550 Speed

START CUT-OUT

1/min: 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed rpm

Del.quantity cm3/: 125.0...129.0 1000 s: (122.0...132.0)

cm3 : 6.00 1000 s: (8.00) Spread

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

Note remarks

: DEE 10,1 d8 : 24.08.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 076 032

Injection pump

Pump designation : PES6P110A720RS296 EP type number : 0 412 016 037

Governor

Governor design. : RSV400...1050P0/426D

: 0 421 835 082 Governer no.

Customer-spec. information Customer : JOHN DEERE

: 6619 A Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.5

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 9 681 230 706

Outside diameter x Wall thickness

: 6,00X2,00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

BEGINNING OF DELIVERY

Prestroke mm : 2,75...2,85 : (2,70...2,90) Rack travel in mm : 9,00...12,00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + -, : 0,50 (0,75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12,20

Del.quantity cm3/: 17,2...17,4

100 s: (-)

cm3 : 0.4Spread

100 s: (-)

2nd speed rpm : 400 Rack travel in mm: 6,80 Del.quantity cm3/: 1,9...2,5

100 s: (-) cm3 : 0,4

100 s: (-)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0,30...0,70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed

rpm : 1050 : 172,0...174,0 Del.quantity

1000 : (-) Spread

cm3 : 4,0 1000 : (-)

RATED SPEED

1st version Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11,20 Speed rpm: 1095...1105 2nd rack travel in: 5,90 Speed rpm: 1135...1165

LOW IDLE 1 Control lever

position degrees: 15...23

Setting point w/out bumper spring

rpm : 400 Rack travel in mm: 6,30

Testing:

Speed rpm : 100 Minimum rack trave: 19,00 : 400 rpm

Rack travel in mm : 6,70...6,90 Rack travel in mm : 2,00

Speed rpm : 520...580

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 630 Rack travel in m: 12,60

Aneroid/Altitude Compensator Test

1st version

Settina

Speed rpm hPa : 273,2 Pressure

Rack travel mm : 9,65...9,75

Measurement

1/min: 500 Speed

1st pressure hPa : 526,5

Rack travel in m: 11,30...1,90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650
Del.quantity cm3/: 177,0...180,0
1000 s: (-) Spread cm3 : 6,0

1000 s: (-)

: 550 Speed rom

Del.quantity cm3/: 84,0...92,0

1000 s: (-)

: 6,0 cm3 Spread

1000 s: (-)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11,20

rpm : 1095...1105 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170,0

1000 s: (-)

Rack travel in mm : 19,00...21,00

HIGH IDLE

1st version

Speed rpm : 1150 Rack travel in mm : 5,90

Del.quantity cm3/: 47.0...57,0 1000 s: (-)

cm3 : 6,0 1000 s: (-) Spread

LOW IDLE

rpm : 400 Speed Rack travel in mm: 6,80

Del.quantity cm3/: 19.0...25,0 1000 s: (-)

cm3 : 4,0Spread

1000 s: (-)

Remarks:

Start-of-delivery mark at control-rod travel 10.5 mm and 15, after start of delivery.

Note remarks

: SCA 11,0 v2 Test sheet : 07.09.89 Edition : 24.7.87 Replaces Test oil : ISO-4113

: 0 402 646 804 Combination no.

Injection pump

Pump designation : PE6P120A720RS7004 : 0 412 626 801 EP type number

Governor

Governor design. : RQ900PA528 : 0 421 801 127 Governer no.

Customer-spec. information

: SAAB - SCANIA Customer

: DS11 43,44,45 Engine

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. C.

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

P

cm3 : 0.6Spread

100 s: (0.9)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

: 207.0...209.0 Del.quantity 1000 : (204.0...212.0)

: 6.00 Spread cm3 : (9.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 22...30

Testing:

1st rack travel in: 11.80 rpm : 900...905 Speed 2nd rack travel in: 4.00 rpm : 941...955 Speed 4th rack travel in: 1000

: 0.00...1.00 Speed rom

LOW IDLE 1

Testing:

Speed rpm : 100 Rack travel in mm: 2.00

# STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...290.0 1000 s: (-)

Rack travel in mm: 20.00...21.00

HIGH IDLE

1st version

Rack travel in mm : 4.90...5.10

cm3 : 4.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Oct. 17, 1988

Engine model DS 11 - 17, before top dead center.

Engine model DSI 11 - 16, before top dead center.

Firing sequence of engine: 1-5-3-6-2-4.

#### Note remarks

: SCA 14,0 h2 : 07.02.89 Test sheet Edition : 29.1.88 Replaces : ISO-4113 Test oil

Combination no. : 0 402 648 839

Injection pump

Pump designation : PE8P120A920/4LS7125T

: 0 412 628 824 EP type number

Governor

Governor design. : RQV200...950PA736-1

: 0 421 813 551 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

: DSC14 03 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

: 1- 2- 7- 3- 4- 5-6-8 Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + -, : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.6)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 225.0 2nd speed

Rack travel in mm: 4.9...5.3

Del.guantity cm3/: 1.6...2.0

100 s: (-)

cm3 : 0.3Spread

100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 225 1st speed

: 1.20...1.60 travel mm

2nd speed

rpm : 350 : 2.30...2.90 travel mm

rpm : 650 3rd speed : 4.40...5.00 travel mm

rpm : 995 4th speed

: 7.70...7.90 travel mm

: 1125 5th speed rpm

: 9.30...9.70 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 900

Del.quantity : 221.0...226.0)

cm3 : 6.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 56...64

Testina:

1st rack travel in: 12.80 rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1110...1140 Speed

4th rack travel in: 1250

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 6...14

Testina:

: 100 Speed rpm Minimum rack trave: 6.50 : 225 rom

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

: 360...420 Speed rom

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

Rack travel mm : 13.80...13.90

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure nPa : 365

Rack travel in m: 12.80...12.90 3rd pressure hPa : 215

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 : 950 Speed rpm

Del.quantity cm3/: 211.0...219.0

1000 s: (209.0...221.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 158.0...162.0 1000 s: (156.0...164.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 240.0...290.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.90...5.10

Remarks:

Test specifications approved by Scania

on 1987-12-15

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO

diaphragm.

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with

respect to setting at least 0.1 mm

Start of delivery - engine: 16, before

Engine firing sequence: 1-5-4-2-6-3-7-8

Note remarks

Test sheet

Edition : 02.05.89

Replaces

Test oil : ISO-4113

Injection pump

Pump designation : PE5P100A720RS491 EP type number : 9 400 087 044

Governor

Governor design: RQ300/1100PA269-1

: 0 421 801 237 Governer no.

Customer-spec. information Customer : MBB

: OM 355-5 Engine

1st version kW : 150.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina (1997)

pressure, bar : 172...175

: 1 680 750 015 Test Lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm

: (3.45...3.65) Rack travel in mm : 9.00...12.00

: 1-2-4-5-Firing order

Phasing : 0-72-144-216-288

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 12.70...12.80

Del.guantity cm3/: 12.5...12.7

100 s: (12.3...12.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 8.1...8.3

Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.5)

cm3 : 0.3Spread

100 s; (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 3001st speed

: 2.30...2.60 travel mm

: 600 2nd speed rom

: 6.90...7.10 travel mm

3rd speed : 1150 rpm

: 7.30...7.70 travel mm

: 1200 4th speed rpm

: 10.00...10.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 600 Speed

Rack travel in mm : 13.40...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

: 125.0...127.0 Del.quantity

1000 : (123.0...129.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 13.6 Testina: 1st rack travel in: 11.70 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1190...1220 Speed 4th rack travel in: 1350 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 8.1 Testing: Speed : 100 rpm Minimum rack trave: 9.70 rpm : 300 Speed Rack travel in mm : 8.00...8.20 Rack travel in mm : 2.00 Speed rpm : 375...415 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/: 117.0...121.0 1000 s: (114.5...123.5) cm3 : 5.00 Spread 1000 s: (7.) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.70 rpm : 1145...1160 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0) Remarks:

## Note remarks

Test sheet : MAC 11, 1a11 : 31.10.89 Edition : 30.5.89 Replaces : ISO-4113 Test oil

Combination no. : 0 402 736 800

Injection pump

Pump designation : PES6P120A720/3RS7135

: 0 412 726 818 EP type number

Governor

Governor design. : RQV325...1050PA848-

Governer no. : 0 421 815 203

Customer-spec, information Customer : MACK

: EM6 300 2VH Engine

: 224.0 1st version kW : 2100 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

### BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm: 4.8...5.0 Del.quantity cm3/: 3.8...4.4

100 s: (3.6...4.6)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm

rpm : 450 2nd speed

: 2.50...2.80 travel mm

rpm : 800 3rd speed

: 4.80...5.00 travel mm

4th speed

rpm : 1050 : 7.30...7.60 travel mm

rpm : 1200 5th speed

: 9.40...9.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1200

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900 Del.quantity : 199.0...201.0 1000 : (196.0...204.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 56...64 Testing: 1st rack travel in: 11.90 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Testing: Speed rpm : 275 Minimum rack trave: 6.30 rpm Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.90...13.00 rpm : 630 2nd speed Rack travel in m: 13.00...13.10 3rd speed rpm : 500 Rack travel in m: 0.00...12.60 Aneroid/Altitude Compensator Test 1st version Settina : 630 **Deed** rom hPa : 900 Pressure Rack travel mm : 13.00...13.10 Measurement 1/min: 630 Speed 1st pressure hPa : -Rack travel in m: 7.80...8.20 2nd pressure hPa : 190

Rack travel in m: 9.10...9.20

3rd pressure hPa : 410 Rack travel in m: 11.40...11.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 630 Speed rpm Del.quantity cm3/: 213.0...219.0 1000 s: (210.0...222.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 121.0...125.0 1000 s: (119.0...127.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 110.0...150.0 1000 s: (100.0...160.0) Rack travel in mm : 7.80...8.20 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. **APPLICATION** Omnibus | Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks : MAC 11,1 a : 30.10.89 Test sheet Edition : 7.2.89 Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing Combination no. : 0 402 746 810 Tolerance + - ., : 0.50 (0.75)Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design. : RQV325...900PA848K rpm: 900 1st speed : 0 421 815 168 Governer no. Rack travel in mm : 13.90...14.00 Customer-spec. information Del.quantity cm3/: 23.6...23.8 Customer : MACK 100 s: (23.3...24.1) Engine : E6-350 4VH cm3 : 0.51st version kW : 261.0 Spread : 1800 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 325.0 Rack travel in mm : 4.0...4.2 Del.quantity cm3/ : 3.2...3.8 100 s: (3.0...4.0) Test oil inlet temp. ., C : 38...42 Overflow valve cm3 : 0.8Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly GUIDE SLEEVE TRAVEL 1st speed : 1.20...1.40 **Opening** travel mm : 207...210 2nd speed rpm : 450 pressure, bar travel mm : 3.10...3.30 rpm : 850 3rd speed Orifice plate : 5.90...6.10 diameter mm : 0,6 travel mm : 1000 4th speed rpm : 7.50...7.70 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Control-lever position

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 17...19 1st version rpm : 900 Speed Aneroid pressure h: 900

Degree: -1 rpm : 1130

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in mm : 7.00...13.00

Speed

Del.quantity : 236.5...238.5 1000 : (233.5...241.5)

cm3: 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 12.90 rpm : 950...960 Speed 2nd rack travel in: 4.00 rpm : 1075...1105 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed rom Minimum rack trave: 5.50 rpm Rack travel in mm : 4.00...4.20 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 900 1st speed rpm Rack travel in m: 13.90...14.00 rpm : 625 2nd speed Rack travel in m: 14.10...14.20 3rd speed rpm: 800 Rack travel in m: 14.00...14.10 th speed rpm : 500 Rack travel in m: 0.00...13.50 4th speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 625 rpm hPa : 900 Pressure : 14.10...14.20 Rack travel mm Measurement 1/min: 625 Speed 1st pressure hPa : -

Rack travel in m: 8.50...8.90

Rack travel in m: 10.00...10.10

2nd pressure hPa : 275

3rd pressure hPa : 570

Rack travel in m: 12.30...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm Del.quantity cm3/: 257.0...263.0 1000 s: (254.0...266.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 142.0...146.0 1000 s: (140.0...148.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 950...960 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm: 8.50...8.90 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.00...4.20 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

: 2.75...2.85 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (2.70...2.90)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4 Note remarks : MAC 11,1 a1 Test sheet : 31.10.89 Edition Replaces : 7.2.89 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 746 814 Tolerance + - ., .: 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 : 0 412 726 807 BASIC SETTING EP type number Governor Governor design. : RQV325...850PA848-1K rpm: 850 1st speed : 0 421 815 169 Governer no. Rack travel in mm : 12.90...13.00 Customer-spec. information : MACK Del.quantity cm3/: 20.0...20.2 Customer 100 s: (19.7...20.5) : E6-300 4VH Engine : 224.0 Spread cm3 : 0.51st version kW : 1900 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 325.0 Rack travel in mm: 4.5...4.7 Test oil Del.quantity cm3/: 3.2...3.8 inlet temp. \_, C : 38...42 100 s: (3.0...4.0) Overflow valve cm3 : 0.8Spread 100 s: (1.2) : 2 417 413 011 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL rpm : 325 1st speed : 1.20...1.40 Openina travel mm rpm : 450 : 207...210 pressure, bar 2nd speed : 2.80...3.10 travel mm rpm : 850 Orifice plate 3rd speed : 0,6 travel mm : 6.20...6.40 diameter mm rpm : 1000 4th speed : 7.70...7.90 travel mm : 1 680 750 008 Test lines GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 rpm : 1100 : 6.00X2.00X600 x Length mm Speed Rack travel in mm : 7.00...13.00 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP 1st version per values Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.3...205.5)

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Spread

: 5.00 cm3 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 52...60

Testing:

1st rack travel in: 11.90 rpm : 900...910 Speed

2nd rack travel in: 4.00

rpm : 1025...1055 Speed

4th rack travel in: 1100

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 7...15

Testing:

Speed rpm : 275 Minimum rack trave: 6.00

rpm

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

: 850 rom 1st speed

Rack travel in m: 12.90...13.00

rpm : 700 2nd speed

Rack travel in m: 13.30...13.50

3rd speed rpm : 600

Rack travel in m: 13.50...13.70 h speed rpm : 500

4th speed

Rack travel in m: 0.00...13.10

Aneroid/Altitude

Compensator Test

1st version

Setting Speed

: 600 rpm hPa : 900

Pressure : 13.50...13.70 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.30

2nd pressure hPa : 250

Rack travel in m: 10.90...11.00

3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700 Del.quantity cm3/: 217.0...223.0 1000 s: (214.0...226.0)

Aneroid pressure h: 900

: 600 rpm

Del.quantity cm3/: 233.0...239.0 1000 s: (230.0...242.0)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 154.0...158.0

1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

rpm : 900...910 Speed

STARTING FUEL DELIVERY

: 100 Speed rom

Del.quantity cm3/: 195.0...235.0

1000 s: (185.0...245.0)

Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MAC 11,1 a2 Test sheet : 31.10.89 Edition : 7.2.89 Replaces Test oil : ISO-4113

Combination no. : 0 402 746 815

Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

Governor

Governor design.: RQV325...850PA848-2K

: 0 421 815 170 Governer no.

Customer-spec, information Customer : MACK

: E6-275 4VH Engine

: 202.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Prestroke mm

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + -., :: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 18.1...18.3

100 s: (17.8...18.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325 travel mm : 1.20...1.40

rpm : 450 2nd speed

: 2.80...3.10 travel mm

rpm : 850 3rd speed

travel mm : 6.20...6.40

: 1000 4th speed rom

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1110 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 900

Del.quantity : 181.0...186.0)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 11.00 Speed rpm : 900...910 2nd rack travel in: 4.00 rpm : 1025...1055 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed : 275 rpm Minimum rack trave: 6.00 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 850 1st speed Rack travel in m: 12.00...12.10 : 600 2nd speed rpm Rack travel in m: 12.60...12.70 rpm : 700 3rd speed Rack travel in m: 12.50...12.70 th speed rpm : 500 Rack travel in m: 0.00...12.40 4th speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 900 Pressure Rack travel mm : 12.60...12.70

Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 9.50...9.90 2nd pressure hPa : 215 Rack travel in m: 10.30...10.40

Rack travel in m: 11.50...11.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 600 rpm Del.quantity cm3/: 210.5...216.5 1000 s: (207.5...219.5) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -: 400 Speed rom Del.quantity cm3/: 144.0...148.0 1000 s: (142.0...150.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.00 rpm : 900...910 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 160.0...200.0 1000 s: (150.0...210.0) Rack travel in mm : 9.50...9.90 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00 1000 s: (12.00) Spread Remarks:

Delivery—valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

3rd pressure hPa : 360

: 2.75...2.85 : (2.70...2.90) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : MAC 11,1 a3 : 31.10.89 : 7.2.89 Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Combination no. : 0 402 746 816 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design. : RQV325...875PA848-3K Governor no. : 0 421 815 171 rpm: 875 1st speed Governer no. Rack travel in mm: 10.80...10.90 Customer-spec. information Del.quantity cm3/: 16.3...16.5 Customer : MACK 100 s: (16.0...16.8) Engine : EM6-250L 4VH : 186.0 cm3 : 0.5Spread 1st version kW : 1950 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.02nd speed Rack travel in mm: 4.5...4.7 Test oil Del.quantity cm3/: 3.9...4.5 inlet temp. \_, C . : 38...42 100 s: (3.7...4.7) cm3 : 0.8 Overflow valve Spread 100 s: (1.2) : 2 417 413 D11 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly 1st speed rpm : 325 : 1.20...1.40 travel mm Openina pressure, bar : 207...210 2nd speed rpm : 450 travel mm : 2.80...3.20 3rd speed rpm : 850 Orifice plate : 6.20...6.40 : 0,6 travel mm diameter mm 4th speed rpm: 1000 : 7.70...7.90 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Outside diameter Control-lever position Degree: -1 Speed rpm: 1100 Rack travel in mm: 7.00...13.00 x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. 1st version per values

rpm : 875

Del.quantity : 103.0...168.0)

Aneroid pressure h: 1200

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 9.80 rpm : 925...935 Speed 2nd rack travel in: 4.00 Speed rpm : 1010...1040 4th rack travel in: 1100 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: rpm : 275 Speed Minimum rack trave: 6.00 Speed rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 10.80...10.90 2nd speed rpm : 510 Rack travel in m: 13.00...13.20 3rd speed rpm : 700 Rack travel in m: 11.60...11.80 4th speed rpm : 550 Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rom hPa : 1200 Pressure Rack travel mm : 13.00...13.20 Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 8.60...9.00 2nd pressure hPa : 215 Rack travel in m: 10.30...10.40

Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 rpm Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 146.0...150.0 1000 s: (144.0...152.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.80 rpm : 925...935 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 145.0...185.0 1000 s: (135.0...195.0) Rack travel in mm: 8.60...9.00 LOW IDLE Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/: 39.0...45.0
1000 s: (37.0...47.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

3rd pressure hPa : 435

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11,1 a4 Test sheet Edition : 31.10.89 : 29.3.89 Replaces Test oil : 0-60-120-180-240-300 : ISO-4113 Phasing Combination no. : 0 402 746 817 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor rpm: 900 Governor design. : RQV325...900PA848-4K 1st speed : 0 421 815 173 Governer no. Rack travel in mm : 15.20...15.30 Customer-spec. information Del.quantity cm3/: 25.0...25.2 Customer : MACK 100 s: (24.7...25.5) : EC6-350 4VH Engine cm3 : 0.5: 261.0 Spread 1st version kW : 1800 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm : 4.9...5.1 Del.quantity cm3/ : 3.9...4.5 Test oil inlet temp. \_, C : 38...42 100 s: (3.7...4.7) cm3 : 0.8Overflow valve Spread 100 s: (1.2) : 2 417 413 011 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly 1st speed : 1.20...1.40 **Opening** travel mm pressure, bar : 207...210 2nd speed rpm : 450 travel mm : 3.10...3.30 3rd speed rpm : 850 Orifice plate 4th speed rpm : 1000 travel mm diameter mm : 0,6 : 1 680 750 008 Test Lines GUIDE SLEEVE POSITION Outside diameter Control-lever position Degree: -1 x Wall thickness : 6.00X2.00X600 x Length mm

Speed rpm : 1130 Rack travel in mm : 7.00...13.00 (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ 1st version rpm : 900 Speed BEGINNING OF DELIVERY Aneroid pressure h: 1200 Del.quantity : 250.5...252.5 1000 : (247.5...255.5) Test pressure, bar: 17...19

: 5.00 cm3 Spread

1000 : (9.00)

### RATED SPEED

1st version Control lever

position degrees: 56...64

Testing:

1st rack travel in: 14.20 rpm : 950...960 Speed

2nd rack travel in: 4.00

Speed rpm : 1090...1120 4th rack travel in: 1200 Speed

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 7...15

Testing:

Speed rpm : 275 Minimum rack trave: 6.40 rpm

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 900 Rack travel in m: 15.20...15.30

rpm : 625 2nd speed

Rack travel in m: 15.50...15.60

3rd speed rpm : 700

Rack travel in m: 15.40...15.60

4th speed rpm : 500 Rack travel in m: <15.00

Aneroid/Altitude Compensator Test

1st version

Setting

: 625 Speed rpm hPa : 1200 Pressure

: 15.50...15.60 Rack travel mm

Measurement

1/min: 625 Speed

1st pressure hPa :-

Rack travel in m: 8.30...8.70
2nd pressure hPa : 280
Rack travel in m: 10.40...10.50
3rd pressure hPa : 650

Rack travel in m: 13.30...13.70

### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 625 Del.quantity cm3/: 278.0...284.0 1000 s: (275.0...287.0)

cm3 : 8.00Spread 1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 400 Del.quantity cm3/: 130.5...134.5 1000 s: (128.5...136.5)

### **BREAKAWAY**

1st version

1mm rack travel less than

full load rack tr: 14.20

rpm : 950...960 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 120.0...160.0 1000 s: (110.0...170.0)

Rack travel in mm: 8.30...8.70

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension

3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: MAC 11,1 a5 : 31.10.89 : 7.2.89 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 746 818

Injection pump

Pump designation: PES6P120A720RS7135

EP type number : 0 412 726 807

Governor

Governor design. : RQV325...875PA848-5K

: 0 421 815 174 Governer no.

Customer-spec. information Customer : MACK

: EM6-275L 4VH Engine

: 202.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Openina** 

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm: 12.20...12.30

Del.quantity cm3/: 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.6...4.8
Del.quantity cm3/: 3.7...4.3
100 s: (3.5...4.5)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

: 1.20...1.40 travel mm rpm : 450 2nd speed : 2.80...3.10 travel mm

: 850 3rd speed rom

: 6.20...6.40 travel mm

: 1000 4th speed rpm

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1110 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 875 Speed Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 11.20 Speed rpm : 925...935 2nd rack travel in: 4.00 Speed rpm: 1030...1060 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed : 275 man Minimum rack trave: 6.10 : 325 rom Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve – 1st version 1st speed rpm : 875 Rack travel in m: 12.20...12.30 and speed rpm : 510 Rack travel in m: 14.10...14.30 2nd speed 3rd speed rpm : 700 Rack travel in m: 13.20...13.40 4th speed rpm : 400 Rack travel in m: 0.00...13.80 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed man hPa : 1200 Pressure : 14.10...14.30 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : -

Rack travel in m: 9.40...9.60 2nd pressure hPa : 280

3rd pressure hPa : 485

Rack travel in m: 10.60...10.70

Rack travel in m: 12.70...13.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 Speed rpm Del.quantity cm3/: 262.5...268.5 1000 s: (259.5...271.5) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 145.0...149.0 1000 s: (143.0...151.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 925...935 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 9.40...9.60 LOW IDLE Speed rpm Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 37.0...43.0 1000 s: (35.0...45.0) 00.8 : Emp Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 11,1 a6 : 31.10.89 : 7.2.89 **Fdition** Replaces : ISO-4113 Test oil Combination no. : 0 402 746 819 Injection bump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 Governor Governor design. : RQV325...875PA848-6K : 0 421 815 175 Governer no. Customer-spec. information Customer : MACK : EM6-225L 4VH Engine : 165.0 1st version kW : 1950 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. \_ C . : 38...42 Overflow valve : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008

Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 17...19

: 2.75...2.85 Prestroke mm : (2.70...2.90) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 875 Rack travel in mm : 11.00...11.10 Del.quantity cm3/: 15.8...16.0 100 s: (15.5...16.3) cm3 : 0.5Spread 100 s: (0.9) rpm : 325.0 2nd speed Rack travel in mm : 4.6...4.8 Del.quantity cm3/: 3.8...4.4 100 s: (3.6...4.6) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed : 1.20...1.40 travel mm rpm : 450 2nd speed travel mm : 2.80...3.10 rpm : 850 3rd speed : 6.20...6.40 travel mm rpm : 1000 4th speed : 7.70...7.90 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm: 1110
Rack travel in mm: 7.00...13.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 875 Speed Aneroid pressure h: 900 Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

cm3 : 5.00Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 10.00 Speed rpm: 925...935 2nd rack travel in: 4.00 rpm : 1015...1045 Speed 4th rack travel in: 1150 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 9...17 Testing: rpm : 275 Speed Minimum rack trave: 6.10 rpm : 325 Speed Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 11.00...11.10 rpm : 510 2nd speed Rack travel in m: 13.20...13.40 3rd speed rpm : 600 Rack travel in m: 12.50...12.70 4th speed rpm : 700 Rack travel in m: 11.80...12.00 5th speed rpm : 350 Rack travel in m: 0.00...13.20 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rpm hPa : 900 Pressure : 13.20...13.40 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.90 2nd pressure hPa : 220

Rack travel in m: 9.70...9.80 3rd pressure hPa : 500 Rack travel in m: 12.00...12.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm Del.quantity cm3/: 234.0...240.0 1000 s: (231.0...243.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 131.0...135.0 1000 s: (129.0...137.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.00 rpm : 925...935 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (125.0...185.0) Rack travel in mm : 8.50...8.90 LOW IDLE Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/: 38.0...44.0
1000 s: (36.0...46.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

: 2.75...2.85 : (2.70...2.90) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : MAC 11,1 b5 : 31.10.89 : 7.2.89 Edition Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasing Combination no. : 0 402 746 820 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 : 0 412 726 807 BASIC SETTING EP type number Governor Governor design. : RQV325...850PA878K 1st speed rpm: 850 : 0 421 815 177 Governer no. Rack travel in mm : 12.00...12.10 Customer-spec. information Del.quantity cm3/: 18.1...18.3 : MACK Customer 100 s: (17.8...18.6) Engine : E6-275 4VH : 202.0 cm3 : 0.51st version kW Spread : 1900 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rom : 325.0 2nd speed Rack travel in mm : 4.5...4.7 Test oil Del.quantity cm3/: 3.2...3.8 inlet temp. ., C . : 38...42 100 s: (3.0...4.0) cm3 : 0.8Overflow valve Spread 100 s: (1.2) : 2 417 413 011 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly rpm : 325 1st speed : 1.20...1.40 travel mm Openina rpm : 450 pressure, bar : 207...210 2nd speed : 2.80...3.10 travel mm rpm : 850 3rd speed Orifice plate : 6.20...6.40 : 0.6 travel mm diameter mm 4th speed rpm : 1000 : 7.70...7.90 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Control-lever position Outside diameter x Wall thickness Degree: -1 rpm : 1110 x Length mm : 6.00x2.00x600 Speed Rack travel in mm : 7.00...13.00 (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. 1st version per values \_\_\_\_ rpm : 850 Speed

Aneroid pressure h: 900

Del.quantity : 181.0...186.0)

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

cm3 : 5.00 1000 : (9.00) cm3 Spread

RATED SPEED

1st version Control Lever

position degrees: 52...60

Testing:

1st rack travel in: 11.00 rpm : 900...910 Speed 2nd rack travel in: 4.00

rpm : 1025...1055

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 7...15

Testina:

man : 275 Speed Minimum rack trave: 6.00 : 325 mom

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.00...12.10

rpm : 600 2nd speed

Rack travel in m: 12.60...12.70

3rd speed : 700 rpm

Rack travel in m: 12.50...12.70

4th speed rpm : 500

Rack travel in m: 0.00...12.40

Aneroid/Altitude

Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 900 Pressure

: 12.60...12.70 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.90

2nd pressure hPa : 215 Rack travel in m: 10.30...10.40

3rd pressure hPa : 360

Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

: 600 Speed rpm

Del.quantity cm3/: 210.5...216.5 1000 s: (207.5...219.5)

cm3 : 8.00 1000 s: (12.0) Spread

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 144.0...148.0 1000 s: (142.0...150.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00

rpm : 900...910 Speed

STARTING FUEL DELIVERY

: 100 Speed rom

Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0)

Rack travel in mm : 9.50...9.90

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.50...4.70

Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAC 11,1 b : 31.10.89 Test sheet Edition : 7.2.89 Replaces : ISO-4113 Test oil

Combination no. : 0 402 746 821

Injection pump

Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807

Governor

Governor design. : RQV325...850PA878-1K

Governer no. : 0 421 815 178

Customer-spec. information Customer : MACK

: E6-300 4VH Engine

: 224.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_ C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 20.0...20.2

100 s: (19.7...20.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325 travel mm : 1.20...1.40

rpm : 450 2nd speed

: 2.80...3.10 travel mm

3rd speed

rpm : 850 : 6.20...6.40 travel mm

rpm : 1000 4th speed

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1100 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

Aneroid pressure h: 900

Del.quantity : 200.5...205.5)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 52...60

Testing:

1st rack travel in: 11.90 Speed rpm: 900...910 2nd rack travel in: 4.00

rpm : 1025...1055 Speed

4th rack travel in: 1100

Speed rom : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 7...15

Testina:

: 275 Speed rpm Minimum rack trave: 6.00 : 325

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rom : 850

Rack travel in m: 12.90...13.00

: 700 2nd speed rpm

Rack travel in m: 13.30...13.50

3rd speed rpm : 600

Rack travel in m: 13.50...13.70 th speed rpm : 500

4th speed

Rack travel in m: 0.00...13.10

Aneroid/Altitude

Compensator Test

1st version

Setting

: 600 Speed rpm Pressure hPa : 900

: 13.50...13.70 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.30

2nd pressure hPa : 250

Rack travel in m: 10.90...11.00

3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

: 700 Speed rom

Del.quantity cm3/: 217.0...223.0 1000 s: (214.0...226.0)

Aneroid pressure h: 900

Speed rpm

Del.quantity cm3/: 233.0...239.0 1000 s: (230.0...242.0)

cm3 : 8.00Spread

1000 s: (12.0) Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

rpm : 900...910 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 195.0...235.0

1000 s: (185.0...245.0)

Rack travel in mm : 9.90...10.30

LOW IDLE

Speed : 325 rpm

Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0) cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

Delivery—valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

: 2.75...2.85 : (2.70...2.90) Prestroke mm BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order Test sheet : MAC 11,1 b1 : 31.10.89 : 7.2.89 Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Phasing Test oil Combination no. : 0 402 746 822 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design. : RQV325...900PA878-2K rom: 900 1st speed : D 421 815 179 Governer no. Rack travel in mm : 13.90...14.00 Customer-spec. information : MACK Del.quantity cm3/: 23.6...23.8 Customer 100 s: (23.3...24.1) Engine : E6-350 4VH cm3 : 0.51st version kW : 261.0 Spread : 1800 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm : 4.0...4.2 Del.quantity cm3/: 3.2...3.8 100 s: (3.0...4.0) Test oil inlet temp. , C : 38...42 cm3 : 0.8Overflow valve Spread 100 s: (1.2) : 2 417 413 011 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly 1st speed rpm : 325 : 1.20...1.40 Opening travel mm : 207...210 rpm : 450 pressure, bar 2nd speed travel mm : 3.10...3.30 3rd speed rpm : 850 Orifice plate : 5.90...6.10 rpm : 1000 diameter mm : 0,6 travel mm 4th speed : 7.50...7.70 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Control-lever position Outside diameter x Wall thickness Degree: -1 Speed rpm: 1130 Rack travel in mm: 7.00...13.00 : 6.00x2.00x600 x Length mm (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. 1st version per values rpm : 900

Speed

Aneroid pressure h: 900

Del.quantity : 236.5...238.5 1000 : (233.5...241.5)

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

cm3 : 5.00Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 55...63 Testing: 1st rack travel in: 12.90 rpm : 950...960 Speed 2nd rack travel in: 4.00 rpm : 1075...1105 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed rpm Minimum rack trave: 5.50 rpm Rack travel in mm : 4.00...4.20 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 900 1st speed rpm Rack travel in m: 13.90...14.00 : 625 2nd speed rom Rack travel in m: 14.10...14.20 3rd speed rpm : 800 Rack travel in m: 14.00...14.10 : 500 4th speed rpm : 500
Rack travel in m: 0.00...13.50 Aneroid/Altitude Compensator Test 1st version Setting Speed man hPa : 900 Pressure Rack travel mm : 14.10...14.20 Measurement 1/min: 625 Speed 1st pressure hPa : -

Rack travel in m: 12.30...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 625 Del.quantity cm3/ : 257.0...263.0 1000 s: (254.0...266.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 142.0...146.0 1000 s: (140.0...148.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 950...960 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 8.50...8.90 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.00...4.20 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00 Spread 1000 s: (12,00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1

start of delivery

Rack travel in m: 8.50...8.90 2nd pressure hPa : 275

Rack travel in m: 10.00...10.10

: 2.75...2.85 : (2.70...2.90) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1 - 5 - 3 - 6 - 2 - 4Test sheet : MAC 11,1 b2 : 31.10.89 : 7.2.89 Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Test oil Phasina Combination no. : 0 402 746 823 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 : 0 412 726 807 EP type number BASIC SETTING Governor Governor design. : RQV325...875PA878-3K rpm: 875 1st speed : 0 421 815 180 Governer no. Rack travel in mm : 12.20...12.30 Customer-spec. information Del.guantity cm3/: 19.0...19.2 : MACK Customer : EM6-275L 4VH 100 s: (18.7...19.5) Engine 1st version kW : 202.0 Spread cm3 : 0.5: 1950 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 325.0 Test oil Rack travel in mm: 4.6...4.8 Del.quantity cm3/: 3.7...4.3 100 s: (3.5...4.5) inlet temp., C : 38...42 cm3 : 0.8Overflow valve Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL 1st speed rpm: 325 : 1.20...1.40 travel mm Opening pressure, bar : 207...210 2nd speed rpm : 450 : 2.80...3.10 travel mm 3rd speed rpm : 850 Orifice plate : 6.20...6.40 : 0,6 diameter mm travel mm 4th speed rpm : 1000 : 7.70...7.90 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Outside diameter Control-Lever position x Wall thickness Degree: -1 : 6.00x2.00x600 rpm : 1110 x Length mm Speed Rack travel in mm : 7.00...13.00 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values \_\_\_\_ 1st version Speed rpm : 875 BEGINNING OF DELIVERY Aneroid pressure h: 1200

Del.quantity : 190.0...192.0 1000 : (187.0...195.0)

Test pressure, bar: 17...19

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 11.20 Speed rpm: 925...935 2nd rack travel in: 4.00 rpm : 1030...1060 Speed 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 9...17 Testina: : 275 Speed rom Minimum rack trave: 1.50 : 325 Speed rpm Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 12.20...12.30 and speed rpm : 510
Rack travel in m: 14.10...14.30 2nd speed rpm : 700 3rd speed Rack travel in m: 13.20...13.40 4th speed rpm : 400 Rack travel in m: 0.00...13.80 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rom hPa : 1200 Pressure : 14.10...14.30 Rack travel mm Measurement 1/min: 510 Speed

1st version Aneroid pressure h: 1200 510 Speed rpm Del.quantity cm3/: 262.5...268.5 1000 s: (259.5...271.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 145.0...149.0 1000 s: (143.0...151.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 925...935 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 9.40...9.60 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 37.0...43.0 1000 s: (35.0...45.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

1st pressure hPa : -

2nd pressure hPa : 280

3rd pressure hPa : 485

Rack travel in m: 9.40...9.60

Rack travel in m: 10.60...10.70

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11,1 b3 Test sheet : 31.10.89 : 7.2.89 Edition Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasing Combination no. : 0 402 746 824 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design. : RQV325...875PA878-4K 1st speed rpm: 875 : 0 421 815 181 Governer no. Rack travel in mm : 11.00...11.10 Customer-spec. information Del.quantity cm3/: 15.8...16.0 Customer : MACK 100 s: (15.5...16.3) : EM6-225L 4VH Engine : 165.0 Spread cm3 : 0.51st version kW : 1950 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 325.0 Rack travel in mm: 4.6...4.8 Test oil Del.quantity cm3/: 3.8...4.4 100 s: (3.6...4.6) inlet temp. \_, C . : 38...42 cm3 : 0.8Overflow valve Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly 1st speed rpm : 325 travel mm : 1.20...1.40 Opening | pressure, bar : 207...210 2nd speed rpm : 450 travel mm : 2.80...3.10
3rd speed rpm : 850 Orifice plate diameter mm : 0,6 travel mm : 6.20...6.40 4th speed rpm : 1000 : 7.70...7.90 travel mm : 1 680 750 008 Test lines GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 Speed rpm: 1110
Rack travel in mm: 7.00...13.00 : 6.00X2.00X600 x Length mm

FULL LOAD DELIV. AT FULL LOAD STOP

rpm : 875

: 158.5...160.5 1000 : (155.5...163.5)

Aneroid pressure h: 900

1st version

Del.quantity

Speed

(A) Injection pump setting values

per values \_\_\_\_

Test pressure, bar: 17...19

BEGINNING OF DELIVERY

Insp. values in parentheses Set equal delivery quant.

Rack travel in m: 9.70...9.80 cm3 : 5.00Spread 1000 : (9.00) 3rd pressure hPa : 500 Rack travel in m: 12.00...12.40 RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 52...60 1st version Aneroid pressure h: 900 : 510 Speed rpm Testina: Del.quantity cm3/: 234.0...240.0 1000 s: (231.0...243.0) 1st rack travel in: 10.00 rpm : 925...935 Speed 2nd rack travel in: 4.00 cm3 : 8.00Spread Speed rpm : 1015...1045 4th rack travel in: 1150 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 131.0...135.0 rpm : 0.00...1.00 Speed LOW IDLE 1 1000 s: (129.0...137.0) Control lever position degrees: 9...17 **BREAKAWAY** Testing: : 275 1st version Speed rpm Minimum rack trave: 6.10 1mm rack travel less than : 325 rpm Rack travel in mm : 4.60...4.80 full load rack tr: 10.00 rpm : 925...935 Speed CONSTANT REGULATION rpm : 325...520 STARTING FUEL DELIVERY Speed TORQUE CONTROL Speed rpm : 100 Del.quantity cm3/: 135.0...175.0 Dimension a mm Torque control curve - 1st version 1000 s: (125.0...185.0) 1st speed rpm : 875 Rack travel in m: 11.00...11.10 Rack travel in mm : 8.50...8.90 nd speed rpm : 510 Rack travel in m: 13.20...13.40 2nd speed LOW IDLE 3rd speed rpm : 600 Rack travel in m: 12.50...12.70 Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 38.0...44.0 rpm : 700 4th speed Rack travel in m: 11.80...12.00 5th speed rpm : 350 1000 s: (36.0...46.0) Rack travel in m: 0.00...13.20 cm3 : 8.00 Spread 1000 s: (12.00) Aneroid/Altitude Remarks: Compensator Test Delivery-valve spring pre-tension 3.0...3.2 mm. 1st version Setting Speed : 510 rpm hPa : 900 Setting and blocking of pointer of Pressure start-of-delivery sensor on cyl. 1 start of delivery : 13.20...13.40 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : Rack travel in m: 8.50...8.90

2nd pressure hPa : 220

: 2.75...2.85 : (2.70...2.90) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : MAC 11,1 b6 : 31.10.89 : 29.3.89 Test sheet Edition Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 746 825 Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS7135 : 0 412 726 807 BASIC SETTING EP type number Governor Governor design. : RQV325...900PA878-5K rpm: 900 1st speed : 0 421 815 182 Governer no. Rack travel in mm : 15.20...15.30 Customer-spec. information Del.quantity cm3/: 25.0...25.2 Customer : MACK 100 s: (24.7...25.5) : EC6-350 4VH Engine Spread cm3 : 0.51st version kW : 261.0 : 1800 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.02nd speed Rack travel in mm: 4.9...5.1 Test oil Del.quantity cm3/: 3.9...4.5 inlet temp. .. C . : 38...42 100 s: (3.7...4.7) Overflow valve Spread cm3 : 0.8100 s: (1.2) : 2 417 413 011 Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly GUIDE SLEEVE TRAVEL 1st speed : 1.20...1.40 **Opening** travel mm : 207...210 2nd speed rpm : 450 pressure, bar : 3.10...3.30 travel mm rpm : 850 3rd speed Orifice plate : 5.90...6.10 : 0,6 travel mm diameter mm rpm : 1000 4th speed : 7.50...7.70 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Control-lever position Outside diameter x Wall thickness Degree: -1 Speed rpm: 1130 Rack travel in mm: 7.00...13.00 : 6.00X2.00X600 x Length mm (A) Injection pump setting values

per values BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Insp. values in parentheses

Set equal delivery quant.

rpm : 900 Aneroid pressure h: 1200 Del.quantity : 250.5...255.5)

1st version Speed

FULL LOAD DELIV. AT FULL LOAD STOP

: 5.00 cm3 Spread

1000 : (9.00)

## RATED SPEED

1st version Control lever

position degrees: 56...64

Testing:

1st rack travel in: 14.20 rpm : 950...960 Speed

2nd rack travel in: 4.00

Speed rpm : 1090...1120 4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275 Minimum rack trave: 6.40

rpm

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 900 1st speed

Rack travel in m: 15.20...15.30

2nd speed

nd speed rpm : 625 Rack travel in m: 15.50...15.60

rpm : 700 3rd speed

Rack travel in m: 15.40...15.60

4th speed rpm : 500

Rack travel in m: <15.00

Aneroid/Altitude Compensator Test

1st version

Setting

: 625 Speed rpm hPa : 1200 Pressure

: 15.50...15.60 Rack travel mm

Measurement

Speed 1/min: 625

1st pressure hPa : -

Rack travel in m: 8.30...8.70
2nd pressure hPa : 280
Rack travel in m: 10.40...10.50

3rd pressure hPa : 650

Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 625 Del.quantity cm3/: 278.0...284.0 1000 s: (275.0...287.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm\_ : 400 Speed

Del.quantity cm3/: 130.5...134.5 1000 s: (128.5...136.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 14.20

rpm : 950...960 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 120.0...160.0 1000 s: (110.0...170.0)

Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325 Rack travel in mm : 4.90...5.10

Del.quantity cm3/: 39.0..45.0 1000 s: (37.0..47.0) Spread cm3: 8.00

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11,1 b4 Test sheet : 31.10.89 Edition Replaces Test oil : 7.2.89 : 0-60-120-180-240-300 : ISO-4113 Phasing Combination no. : 0 402 746 826 Tolerance + - ... : 0.50 (0.75)Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design. : RQV325...875PA878-6K Governer no. : 0 421 815 183 rpm: 875 1st speed Rack travel in mm : 10.80...10.90 Customer-spec. information : MACK Del.quantity cm3/: 16.3...16.5 Customer 100 s: (16.0...16.8) Engine : EM6-250L 4VH cm3 : 0.51st version kW : 186.0 Spread : 1950 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7 Test oil Del.quantity cm3/: 3.9...4.5 inlet temp., C : 38...42 100 s: (3.7...4.7) cm3 : 0.8Overflow valve Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL 1st speed rpm : 325 : 1.20...1.40 travel mm Opening pressure, bar : 207...210 2nd speed rpm : 450 travel mm : 2.80...3.20 3rd speed rpm: 850 Orifice plate : 6.20...6.40 : 0,6 travel mm diameter mm 4th speed rpm: 1000 : 7.70...7.90 travel mm Test Lines : 1 680 750 008 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 Speed rpm : 1100 Rack travel in mm : 7.00...13.00 : 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values 1st version

rpm : 875

Del.quantity : 163.0...165.0 1000 : (160.0...168.0)

Aneroid pressure h: 1200

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 52...60

Testing:

1st rack travel in: 9.80 Speed rpm : 925...935 2nd rack travel in: 4.00 rpm : 1010...1040 Speed

4th rack travel in: 1100

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 9...17

Testing:

: 275 Speed rpm Minimum rack trave: 6.00 rpm : 325 Speed

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 875 Rack travel in m: 10.80...10.90

2nd speed

nd speed rpm : 510 Rack travel in m: 13.00...13.20

rpm : 700 3rd speed

Rack travel in m: 11.60...11.80

4th speed rpm : 550

Rack travel in m: 0.00...13.10

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 510 hPa : 1200 Speed rom Pressure

: 13.00...13.20 Rack travel mm

Measurement

 $1/\min : 510$ Speed

1st pressure hPa : -

Rack travel in m: 8.60...9.00 2nd pressure hPa : 215 Rack travel in m: 10.30...10.40

3rd pressure hPa : 435

Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed : 510 rpm

Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: rpm : 400 Speed

Del.quantity cm3/: 146.0...150.0

1000 s: (144.0...152.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.80

Speed rpm : 925...935

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 145.0...185.0

1000 s: (135.0...195.0)

Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm

Rack travel in mm : 4.50...4.70

Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 c : 31.10.89 : 7.2.89 Edition Replaces Test oil : ISO-4113

Combination no. : 0 402 746 827

Injection pump

Pump designation : PES6P120A720RS7148 : 0 412 726 810 EP type number

Governor

Governor design. : RQV325...875PA848-7K

: 0 421 815 176 Governer no.

Customer-spec. information : MACK Customer

: EM6 300L 4VH Engine

: 224.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 Prestroke mm : (2.70...2.90)

Rack travel in mm : 6.00...8.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ., .: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 11.10...11.20

Del.guantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

cm3 : 0.5 Spread

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7

Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7)

Spread

cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 325 : 1.20...1.40 travel mm

rpm : 450 2nd speed

: 2.50...2.80 travel mm

rpm : 600 3rd speed

travel mm : 4.10...4.30

rpm : 875 4th speed

: 7.30...7.50 travel mm

rpm : 1000 5th speed

: 8.70...9.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1040

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 1500

Del.quantity : 199.0...201.0 1000 : (196.0...204.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 55...63 Testing: 1st rack travel in: 10.10 rpm : 915...925 Speed 2nd rack travel in: 4.00 Speed rpm : 1000...1030 4th rack travel in: 1150 Speed rpm : 0.00...1.00LOW TDLE 1 Control Lever position degrees: 7...15 Testina: Speed rpm : 275 Minimum rack trave: 6.00 Speed mom Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 11.10...11.20 nd speed rpm : 510 Rack travel in m: 16.50...16.70 2nd speed : 700 3rd speed rpm Rack travel in m: 13.30...13.50 : 600 4th speed rpm Rack travel in m: 15.50...15.70 5th speed rpm : 450 Rack travel in m: 0.00...16.60 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 510 hPa : 1500 Pressure : 16.50...16.70 Rack travel mm

Measurement 1/min: 510 Speed 1st pressure hPa : -

Rack travel in m: 8.30...8.70 2nd pressure hPa : 370 Rack travel in m: 10.70...10.80 3rd pressure hPa : 710 Rack travel in m: 14.40...14.80 FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1500 Speed : 510 rpm Del.quantity cm3/: 299.0...305.0 1000 s: (296.0...308.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 152.5...156.5 1000 s: (150.5...158.5)

BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 10.10 rpm : 915...925 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm Del.quantity cm3/: 140.0...160.0 1000 s: (135.0...165.0) Rack travel in mm : 8.30...8.70

LOW IDLE

Speed : 325 rpm Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Note remarks : MAC 11,1 d Test sheet : 31.10.89 : 7.2.89 Edition Replaces Test oil : ISO-4113 Phasing : 0 402 746 828 Combination no. Injection pump Pump designation : PES6P120A720RS7148 EP type number : 0 412 726 810 Governor Governor design. : RQV325...875PA878-7K 1st speed : 0 421 815 184 Governer no. Customer-spec. information Customer : MACK : EM6 300L 4VH Engine : 224.0 Spread 1st version kW : 1950 Rated speed TEST BENCH REQUIREMENTS 2nd speed Test oil inlet temp. \_, C : 38...42 Overflow valve Spread : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Rack travel in mm : 6.00...8.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Tolerance + - . . . : 0.50 (0.75)Time to cyl. no. : 1 BASIC SETTING rpm: 875 Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 19.9...20.1 100 s: (19.6...20.4) cm3 : 0.5100 s: (0.9) rpm : 325.0Rack travel in mm: 4.5...4.7 Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7) cm3 : 0.8 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 325 : 1.20...1.40 1st speed travel mm rpm : 450 2nd speed travel mm : 2.50...2.80 3rd speed rpm : 600 : 4.10...4.30 travel mm rpm : 875 : 7.30...7.50 4th speed travel mm rpm : 1000 5th speed : 8.70...9.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1040 Speed Rack travel in mm : 6.00...12.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 875 Speed Aneroid pressure h: 1500

: 199.0...201.0 Del.quantity 1000 : (196.0...204.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testing: 1st rack travel in: 10.10 Speed rpm : 915...925 2nd rack travel in: 4.00 rpm : 1000...1030 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: rpm : 275 Speed Minimum rack trave: 6.00 Speed rpm: 325 Rack travel in mm: 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 875 1st speed rpm Rack travel in m: 11.10...11.20 2nd speed rpm : 510 Rack travel in m: 16.50...16.70 3rd speed rpm : 700 Rack travel in m: 13.30...13.50 4th speed rpm : 600 Rack travel in m: 15.50...15.70 : 450 5th speed rpm Rack travel in m: 0.00...16.60 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rpm hPa : 1500 Pressure : 16.50...16.70 Rack travel mm Measurement 1/min: 510 Speed

Rack travel in m: 8.30...8.70 2nd pressure hPa : 370 Rack travel in m: 10.70...10.80 3rd pressure hPa : 710 Rack travel in m: 14.40...14.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 : 510 Speed rpm Del.quantity cm3/: 299.0...305.0 1000 s: (296.0...308.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 152.5...156.5 1000 s: (150.5...158.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.10 rpm : 915...925 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (135.0...165.0) Rack travel in mm : 8.30...8.70 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/ : 39.0...45.0 1000 s: (37.0...47.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

1st pressure hPa : -

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAC 11.1 a7 : 30.10.89 : 7.2.89 Test sheet Edition Replaces Test oil : ISO-4113

: 0 402 746 829 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135

: 0 412 726 807 EP type number

Governor

: RQV325...1050PA848-8 Governor design.

: 0 421 815 185 Governer no.

Customer-spec. information Customer

Engine : E6-270 4VH

1st version kW : 201.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 17.4...17.6

100 s: (17.1...17.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.9...5.1 Del.quantity cm3/: 3.8...4.4

100 s: (3.6...4.6)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm

2nd speed : 450 rpm

2.50...2.80 travel mm

rpm : 800 3rd speed

travel mm : 4.80...5.00

4th speed rpm : 1050

: 7.30...7.60 travel mm

rpm : 1200 5th speed

travel mm : 9.40...9.60

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1 rpm : 1210 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

Aneroid pressure h: 900 : 174.0...176.0 Del.quantity 1000 : (171.0...179.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testina: 1st rack travel in: 11.20 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Testina: : 275 Speed rpm Minimum rack trave: 6.40 : 325 rpm Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.20...12.30 2nd speed rpm : 630 Rack travel in m: 12.00...12.20 3rd speed rpm : 925 Rack travel in m: 11.90...12.10 4th speed rpm : 800 Rack travel in m: 12.20...12.40 Aneroid/Altitude Compensator Test 1st version Setting : 630 Speed rpm hPa : 900 Pressure Rack travel mm : 12.00...12.10 Measurement Speed  $1/\min : 630$ 

2nd pressure hPa : 270 Rack travel in m: 9.60...9.70 3rd pressure hPa : 400 Rack travel in m: 11.00...11.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 630 Del.quantity cm3/: 192.0...198.0 1000 s: (189.0...201.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 129.0...133.0 1000 s: (127.0...135.0) **BREAKAWAY** 1st version 1mm rack travel less tham full load rack tr: 11.20 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (125.0...185.0) Rack travel in mm : 8.60...9.00 LOW IDLE Speed rpm: 325
Rack travel in mm: 4.90...5.10 Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) : 8.00 Spread cm3 1000 s: (12.00) Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

1st pressure hPa : -

Rack travel in m: 8.60...9.00

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a10 30.10.89 7.10.88 Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 746 831

Injection pump

Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807

Governor

Governor design. : RQV325...1050PA848-9

: 0 421 815 187 Governer no.

Customer-spec. information Customer : MACK

: EM6 300 2VH Engine

: 224.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 9 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 10.30...10.70 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm : 4.8...5.0 Del.quantity cm3/ : 3.8...4.4 100 s: (3.6...4.6)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.40...1.60 travel mm

rpm : 450 2nd speed

: 2.50...2.80 travel mm

: 800 3rd speed rpm

: 4.80...5.00 travel mm

: 1050 4th speed rpm

: 7.30...7.60 travel mm

: 1200 5th speed rpm

: 9.40...9.60 travel mm

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -1 rpm : 1200 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050Speed

Aneroid pressure h: 900 : 199.0...201.0 Del.quantity : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 56...64 Testing: 1st rack travel in: 11.90 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 10...18 Testing: Speed : 275 rom Minimum rack trave: 6.30 rpm : 325 Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.90...13.00 nd speed rpm : 630 Rack travel in m: 13.00...13.10 2nd speed : 500 3rd speed rpm Rack travel in m: 0.00...12.60 Aneroid/Altitude Compensator Test 1st version Setting : 630 Speed rpm Pressure hPa : 900 Rack travel mm : 13.00...13.10 Measurement

1000 : (196.0...204.0) 1/min: 630 Speed 1st pressure hPa : -Rack travel in m: 7.80...8.20

Rack travel in m: 11.40...11.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 630 Del.quantity cm3/: 213.0...219.0 1000 s: (210.0...222.0) cm3 : 8.00 Spread 1000 s: (12.0) rpm : 400 Speed Del.quantity cm3/: 121.0...125.0 1000 s: (119.0...127.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 110.0...150.0 1000 s: (100.0...160.0) Rack travel in mm: 7.80...8.20 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.80...5.00

Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) cm3 : 8.00Spread 1000 s: (12.00)

Remarks:

Because of flattening, set the spring preload on new delivery-valve holders to 3.0...3.1 mm.

APPLICATION

**Omnibus** 

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

2nd pressure hPa : 190

3rd pressure hPa : 410

Rack travel in m: 9.10...9.20

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: MAC 11,1 a8 Test sheet Edition : 30.10.89 : 10.2.88 Replaces Test oil : ISO-4113

: 0 402 746 832 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135 : 0 412 726 807 EP type number

Governor

: RQV325...900PA848-10 Governor design.

: 0 421 815 189 Governer no.

Customer-spec. information : MACK Customer

: EM6 275 2VH Engine

: 202.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY Test pressure, bar: 17...19 Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 18.7...18.9

100 s: (18.4...19.2)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm: 4.6...4.8 Del.quantity cm3/: 3.7...4.3

100 s: (3.5...4.5)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.20...1.40 travel mm : 450 2nd speed rpm

travel mm

: 3.10...3.30

: 850 3rd speed rpm

: 5.90...6.10 travel mm

: 1000 4th speed rpm

: 7.50...7.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed Aneroid pressure h: 900 Del.quantity : 187.0...192.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 51...59 Testing: 1st rack travel in: 11.30 rpm : 950...960 Speed 2nd rack travel in: 4.00 rpm : 1055...1085 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed rpm : 275 Minimum rack trave: 6.10 Speed rpm : 325 Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...480 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 900 1st speed rpm Rack travel in m: 12.30...12.40 rpm : 540 2nd speed Rack travel in m: 13.40...13.60 3rd speed rpm : 700 Rack travel in m: 12.70...12.90 th speed rpm : 450 4th speed rpm Rack travel in m: 0.00...13.50 Aneroid/Altitude Compensator Test 1st version Setting : 540 beea man hPa : 900 Pressure Rack travel mm : 13.40...13.60 Measurement 1/min: 540 Speed 1st pressure hPa : -

Rack travel in m: 9.00...9.40

2nd pressure hPa : 320

Rack travel in m: 10.20...10.30 3rd pressure hPa : 550 Rack travel in m: 12.00...12.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 540 Speed rpm Del.quantity cm3/: 239.0...247.0 1000 s: (237.0...249.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -Speed rpm Del.quantity cm3/: 142.0...146.0 1000 s: (140.0...148.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 rpm : 950...960 Speed STARTING FUEL DELIVERY LOW IDLE Speed rpm: 325
Rack travel in mm: 4.60...4.80
Del.quantity cm3/: 37.0...43.0
1000 s: (35.0...45.0)
Spread cm3: 8.00
1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAC 11,1 a9 : 30.10.89 Test sheet Edition : 10.2.89 Replaces : ISO-4113 Test oil

Combination no. : 0 402 746 833

Injection pump

Pump designation : PES6P120A720RS7135

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...975PA848-11

: 0 421 815 190 Governer no.

Customer-spec. information : MACK Customer

: E6-350 2VH Engine

: 257.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test Lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 975 1st speed

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 325.0 Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 3.8...4.4 100 s: (3.6...4.6)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed : 1.40...1.60 travel mm

rom : 450 2nd speed

: 2.50...2.80 travel mm

rpm : 800 3rd speed

: 4.80...5.00 travel mm : 1050 4th speed rpm

: 7.30...7.60 : 1200 travel mm

5th speed rpm

: 9.40...9.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 975 Speed

Aneroid pressure h: 900 : 230.5...232.5 Del.quantity 1000 : (227.5...235.5) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testina: 1st rack travel in: 13.10 Speed rpm : 1015...1025 2nd rack travel in: 4.00 Speed rpm : 1130...1160 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 10...18 Testina: : 275 Speed rpm Minimum rack trave: 6.00 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 975 1st speed Rack travel in m: 14.10...14.20 2nd speed rpm : 700 Rack travel in m: 13.70...13.90 3rd speed rpm : 600 Rack travel in m: 0.00...13.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 700 rom hPa : 900 Pressure : 13.80...13.90 Rack travel mm Measurement 1/min: 700 Speed 1st pressure hPa : -Rack travel in m: 7.80...8.20 2nd pressure hPa : 240 Rack travel in m: 9.30...9.40

3rd pressure hPa : 510 Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 rpm : 700 Speed Del.quantity cm3/: 237.0...233.0 1000 s: (224.0...236.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 125.0...129.0 1000 s: (123.0...131.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.10 rpm : 1015...1025 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 110.0...150.0 1000 s: (100.0...160.0) Rack travel in mm: 7.80...8.20 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 17...19 Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Note remarks Test sheet : MAC 12,0 a : 1-5-3-6-2-4 : 30.10.89 Edition Firing order : 10.2.89 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 836 : 0-60-120-180-240-300 Phasina Phasing .: 0.50 (0.75) Injection pump Tolerance + -., Pump designation : PES6P120A720RS7157 : 0 412 726 814 EP type number Time to cyl. no. : 1 Governor Governor design. : RQV325...900PA848-12 BASIC SETTING rpm: 900 : 0 421 815 192 1st speed Governer no. Rack travel in mm : 15.50...15.60 Customer-spec. information Customer : MACK Del.quantity cm3/: 27.2...27.4 : E7-400 4VH Engine 100 s: (26.9...27.7) : 298.0 1st version kW : 1800 Spread cm3 : 0.5Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 Test oil 2nd speed Rack travel in mm: 4.9...5.1 inlet temp. ., C : 38...42 Del.quantity cm3/: 4.3...4.9 100 s: (4.1...5.1) Overflow valve : 2 417 413 011 cm3 : 0.8Spread 100 s: (1.2) Overflow quantity min. 1/h: 160...170 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly rpm : 325 1st speed 1.30...1.60 travel mm Opening rpm : 500 : 207...210 2nd speed pressure, bar travel mm : 3.40...4.00 rpm : 900 3rd speed Orifice plate : 6.70...6.90 : 0,6 travel mm diameter mm rpm : 1075 4th speed : 8.40...8.90 travel mm Test Lines : 1 680 750 008 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 x Lenath mm : 6.00X2.00X600 Speed rpm : 1120 Rack travel in mm : 7.00...13.00 (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. 1st version per values \_\_\_ rpm : 900 Speed BEGINNING OF DELIVERY Aneroid pressure h: 1200

Del.quantity : 272.0...274.0 1000 : (269.0...277.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 56...64

Testing:

1st rack travel in: 14.50 Speed rpm : 940...950 2nd rack travel in: 4.00 rpm : 1115...1145

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 10...18

Testing:

: 275 Speed rpm Minimum rack trave: 6.40 : 325 rpm

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 325...500 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

: 900 1st speed ngn

Rack travel in m: 15.50...15.60

: 625 2nd speed rpm

Rack travel in m: 15.30...15.50

3rd speed : 500 rpm

Rack travel in m: 0.00...14.60

Aneroid/Altitude Compensator Test

1st version Settina

: 900 Speed man hPa : 1200 Pressure

: 15.50...15.60 Rack travel mm

Measurement

1/min: 900 Speed

1st pressure hPa : - Rack travel in m: 8.20...8.60

2nd pressure hPa : 225

Rack travel in m: 9.40...9.50

3rd pressure hPa : 770

Rack travel in m: 13.80...14.20

START CUT-OUT

1/min: 280 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 625 Speed rpm

Del.quantity cm3/: 309.0...315.0 1000 s: (306.0...318.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 166.0...170.0 1000 s: (164.0...172.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.50 rpm : 940...950 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...210.0 1000 s: (160.0...220.0)

Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm: 325 Rack travel in mm: 4.90...5.10 Del.quantity cm3/: 43.0...49.0 1000 s: (41.0...51.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a1 Edition : 30.10.89 Replaces : 10.2.89 Test oil : ISO-4113

: 0 402 746 837 Combination no.

Injection pump

Pump designation : PES6P120A720RS7157

: 0 412 726 814 EP type number

Governor

Governor design. : RQV325...900PA848-15

: 0 421 815 193 Governer no.

Customer-spec. information : MACK Customer

: E7-350 4VH Engine

: 261.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Phasing

Tolerance + - .. .: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 22.8...23.0

100 s: (22.5...23.3)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 4.1...4.7

100 s: (3.9...4.9)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 325 : 1.30...1.60 1st speed

travel mm

rpm : 500 2nd speed

travel mm : 3.40...4.00

rpm : 900 3rd speed

: 6.70...6.90 travel mm

: 1075 4th speed rpm

: 8.40...8.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900 Aneroid pressure h: 900

: 228.0...230.0 1000 : (225.0...233.0) Del.quantity : 5.00 Spread cm3 : (9.00) 1000 RATED SPEED

1st version Control Lever

position degrees: 56...64

Testing:

1st rack travel in: 13.00 rpm : 950...960 Speed 2nd rack travel in: 4.00

rpm : 1100...1130 Speed

4th rack travel in: 1250

rom : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 10...18

Testing:

Speed : 275 rpm Minimum rack trave: 6.80

Speed rpm : 325 Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 325...500 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

: 900 1st speed rom

Rack travel in m: 14.00...14.10

rpm : 625 2nd speed

Rack travel in m: 13.80...14.00

: 500 3rd speed rpm

Rack travel in m: 0.00...13.20

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 900 rpm hPa : 900 Pressure

: 14.00...14.10 Rack travel mm

Measurement

1/min: 900 Speed

1st pressure hPa : -

Rack travel in m: 8.80...9.20 2nd pressure hPa : 225

Rack travel in m: 10.20...10.30

3rd pressure hPa : 545

Rack travel in m: 12.70...13.10

START CUT-OUT

1/min : 265 (275) Speed

FUFL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed : 625 rpm

Del.quantity cm3/: 260.0...266.0 1000 s: (257.0...269.0)

Spread cm3 : 8.00 1000 s: (12.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 166.0...170.0 1000 s: (164.0...172.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 950...960 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0)

Rack travel in mm : 10.40...10.80

LOW IDLE

Spread

Speed rpm : 325 Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 41.0...47.0 1000 s: (39.0...49.0)

cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Test pressure, bar: 17...19 BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.75...2.85 Note remarks Prestroke mm : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 : MAC 12,0 a2 : 30.10.89 Test sheet Edition Replaces : 10.2.89 : ISO-4113 Test oil : 0-60-120-180-240-300 Combination no. : 0 402 746 838 Phasing Phasing Injection pump Tolerance + -, .: 0.50 (0.75) Pump designation : PES6P120A720RS7157 EP type number : 0 412 726 814 Time to cyl. no. : 1 Governor : RQV325...875PA848-14 BASIC SETTING Governor design. : 0 421 815 194 1st speed rpm: 875 Governer no. Rack travel in mm : 10.30...10.40 Customer—spec. information Customer Del.quantity cm3/: 17.3...17.5 : EM7-250L 4VH Engine 100 s: (17.0...17.8) 1st version kW : 187.0 : 1950 Spread cm3 : 0.5Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 Test oil 2nd speed Rack travel in mm: 4.7...4.9 inlet temp. ., C . : 38...42 Del.quantity cm3/: 4.1...4.7 Overflow valve 100 s: (3.9...4.9) cm3 : 0.8: 2 417 413 011 Spread 100 s: (1.2) Overflow quantity min. 1/h: 160...170 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly rpm : 325 1st speed travel mm : 1.30...1.60 Openina : 207...210 2nd speed 500 pressure, bar man : 3.40...4.00 : 900 travel mm 3rd speed Orifice plate rpm : 0,6 travel mm : 6.70...6.90 diameter mm : 1075 4th speed rpm : 8.40...8.90 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Control-lever position Outside diameter x Wall thickness Degree: -1 rpm : 1120 x Length mm : 6.00X2.00X600 Speed Rack travel in mm : 6.00...12.00 (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. 1st version per values Speed rpm : 875

Aneroid pressure h: 900

BEGINNING OF DELIVERY

Del.quantity : 173.0...175.0 1000 : (170.0...178.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 9.30 Speed rpm : 915...925 2nd rack travel in: 4.00 rpm : 1020...1050 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Testing: : 275 Speed man Minimum rack trave: 6.20 : 325 Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 325...500 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 10.30...10.40 : 510 2nd speed rpm Rack travel in m: 11.90...12.10 : 450 3rd speed rpm Rack travel in m: 0.00...11.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 510 rpm hPa : 900 Pressure : 11.90...12.10 Rack travel mm Measurement Speed 1/min: 510 1st pressure hPa : -Rack travel in m: 8.30...8.70 2nd pressure hPa : 205 Rack travel in m: 9.30...9.40

Rack travel in m: 11.00...11.40 START CUT-OUT 1/min: 265 (275) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm Del.quantity cm3/: 244.0...250.0 1000 s: (241.0...253.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -: 400 Speed rpm Del.quantity cm3/: 168.0...172.0 1000 s: (166.0...174.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 rpm : 915...925 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm: 9.80...10.20 LOW IDLE Speed rpm: 325 Rack travel in mm: 4.70...4.90 Del.quantity cm3/: 41.0...47.0 1000 s: (39.0...49.0) Spread cm3: 8.00 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

3rd pressure hPa : 400

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.75...2.85 : (2.70...2.90) Prestroke mm Note remarks Rack travel in mm: 6.00...8.00 : 1-5-3-6-2-4 : MAC 12,0 b Test sheet Firing order : 30.10.89 Edition : 10.2.89 Replaces : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing : 0 402 746 839 Combination no. Tolerance + - ., .: 0.50 (0.75)Injection pump Pump designation : PES6P120A720RS7148 Time to cyl. no. : 1 : 0 412 726 810 EP type number BASIC SETTING Governor : RQV325...875PA848-19 Governor design. rpm: 875 1st speed : 0 421 815 199 Governer no. Rack travel in mm : 11.50...11.60 Customer-spec. information Del.quantity cm3/: 21.0...21.2 : MACK Customer 100 s: (20.7...21.5) : EN7 300L 4VH Engine cm3 : 0.5: 224.0 Spread 1st version kW : 1950 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7 Test oil Del.quantity cm3/: 4.1...4.7 inlet temp. ., C . : 38...42 100 s: (3.9...4.9) cm3 : 0.8Overflow valve Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL rpm : 325 1st speed 1.20...1.40 Opening travel mm : 207...210 2nd speed : 450 pressure, bar man travel mm 2.50...2.80 : 600 Orifice plate 3rd speed rpm : 4.10...4.30 diameter mm : 0,6 travel mm : 875 4th speed rpm : 7.30...7.50 travel mm : 1000 : 1 680 750 008 Test lines 5th speed rpm : 8.70...9.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X2.00X600 x Length mm Control-lever position Degree: -1 rpm : 1030 (A) Injection pump setting values Speed Rack travel in mm : 6.00...12.00 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

Speed

rpm : 875

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Aneroid pressure h: 1200 : 210.0...212.0 Del.quantity 1000 : (207.0...215.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 57...65 Testing: 1st rack travel in: 10.50 rpm : 915...925 Speed 2nd rack travel in: 4.00 rpm : 1000...1030 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 8...16 Testina: rpm Speed Minimum rack trave: 6.00 rpm : 325 Speed Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rom : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version t speed rpm : 875 Rack travel in m: 11.50...11.60 1st speed rpm : 510 2nd speed rom Rack travel in m: 16.00...16.20 3rd speed rpm : 800 Rack travel in m: 12.00...12.20 4th speed rpm : 600 Rack travel in m: 15.10...15.30 5th speed rpm : 450 Rack travel in m: 0.00...15.70 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rpm hPa : 1200 Pressure : 16.00...16.20 Rack travel mm Measurement 1/min: 510 Speed

1st pressure hPa : -Rack travel in m: 8.70...9.10 2nd pressure hPa : 325 Rack travel in m: 10.60...10.70 3rd pressure hPa : 815 Rack travel in m: 14.30...14.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed : 510 rpm Del.quantity cm3/: 294.0...300.0 1000 s: (291.0...303.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 166.0...170.0 1000 s: (164.0...172.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 915...925 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 165.0...185.0 1000 s: (155.0...195.0) Rack travel in mm: 8.70...9.10 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 41.0...47.0 1000 s: (39.0...49.0) Spread cm3: 8.00 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MAC 11,1a12 : 30.10.89 Test sheet Edition : 10.2.89 Replaces : ISO-4113 Test oil

: 0 402 746 840 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135 : 0 412 726 807

EP type number Governor

Governor design. : RQV325...875PA848-18

: 0 421 815 198 Governer no.

Customer-spec. information Customer : MACK

: EMC6 250L 4VH Engine

: 187.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 17.3...17.5

100 s: (17.0...17.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7

Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 325 : 1.20...1.40 travel mm

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 850

: 6.20...6.40 travel mm

: 1000 4th speed rpm

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 1200

Del.quantity : 173.0...175.0 1000 : (170.0...178.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 54...62 Testing: 1st rack travel in: 10.20 Speed rpm : 915...925 2nd rack travel in: 4.00 rpm : 1010...1040 Speed 4th rack travel in: 1100 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 9...17 Testing: Speed : 275 rom Minimum rack trave: 6.00 : 325 Speed rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 11.20...11.30 and speed rpm : 510
Rack travel in m: 13.10...13.30 2nd speed rpm : 700 3rd speed Rack travel in m: 12.00...12.20 rpm : 450 4th speed Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rpm hPa : 1200 Pressure : 13.10...13.30 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 9.10...9.50

Rack travel in m: 10.30...10.40 3rd pressure hPa : 435 Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 Speed rpm Del.quantity cm3/: 239.0...245.0 1000 s: (236.0...248.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.guantity cm3/: 146.0...150.0 1000 s: (144.0...152.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.20 Speed rpm : 915...925 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0) Rack travel in mm : 9.10...9.50 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) cm3 : 8.00Spread 1000 s: (12.00)

## Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

2nd pressure hPa : 215

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 11,1 e Edition : 30.10.89 Replaces : 10.2.89 Test oil : ISO-4113 Combination no. : 0 402 746 842 Injection pump Pump designation : PES6P120A720RS7164 EP type number : 0 412 726 816 Governor : RQV325...875PA848-17 Governor design. : 0 421 815 200 Governer no. Customer-spec. information Customer : MACK : EMC6 300L 4VH Engine

: 200.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 17...19 Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 11.00...13.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 14.60...14.70

Del.quantity cm3/: 21.9...22.1

100 s: (21.6...22.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL rpm : 325 1st speed

: 1.20...1.40 travel mm : 450 2nd speed rom

travel mm

: 3.00...3.40 : 850 3rd speed rpm : 5.90...6.10 travel mm

: 1000 4th speed rpm

: 7.40...7.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 875 Speed Aneroid pressure h: 1200

: 219.0...221.0 Del.quantity 1000 : (216.0...224.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 54...62 Testing: 1st rack travel in: 13.60 rpm : 915...925 Speed 2nd rack travel in: 4.00 Spread rpm : 1060...1090 Speed 4th rack travel in: 1160 rpm : 0.00...1.00 Speed Speed LOW IDLE 1 Control lever position degrees: 10...18 **BREAKAWAY** Testing: Speed rpm Minimum rack trave: 5.80 Speed rpm : 325 Rack travel in mm : 4.30...4.50 Speed CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Speed Torque control curve - 1st version : 875 1st speed rpm Rack travel in m: 14.60...14.70 rpm : 510 2nd speed Rack travel in m: 16.70...16.90 LOW IDLE rpm : 700 3rd speed Rack travel in m: 15.30...15.50 4th speed rpm : 600 Rack travel in m: 16.00...16.20 : 420 5th speed rpm Rack travel in m: 0.00...16.80 Spread Aneroid/Altitude Compensator Test Remarks: 1st version Setting Speed rpm : 510 hPa : 1200 Pressure Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 Rack travel mm : 16.70...16.90 start of delivery Measurement 1/min: 510 Speed 1st pressure hPa : -

Rack travel in m: 10.40...10.80 2nd pressure hPa : 375 Rack travel in m: 12.10...12.20 3rd pressure hPa : 735 Rack travel in m: 15.10...15.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 rpm Del.quantity cm3/: 304.0...310.0 1000 s: (301.0...313.0) cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 400 Del.quantity cm3/: 156.0...160.0 1000 s: (154.0...162.0) 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 915...925 STARTING FUEL DELIVERY : 100 man Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0) Rack travel in mm : 10.40...10.80 Speed rpm: 325
Rack travel in mm: 4.30...4.50
Del.quantity cm3/: 39.0...45.0
1000 s: (37.0...47.0) cm3 : 8.001000 s: (12,00) Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Note remarks

Test sheet : MAC 11,1a15 : 31.10.89 Edition Replaces : 7.4.89 Test oil : ISO-4113

: 0 402 746 846 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135 : 0 412 726 807

EP type number

Governor

: RQV325...850PA848-23 Governor design.

: 0 421 815 204 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: E6 300 4VH Engine

: 224.0 1st version kW : 1700 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 20.0...20.2

100 s: (19.7...20.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.20...1.40 travel mm

: 450 2nd speed rpm

: 2.80...3.10 travel mm

: 850 3rd speed rpm

: 6.20...6.40 travel mm

: 1000 4th speed rpm

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

Speed rpm : 1100 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 900

: 200.0...202.0 1000 : (197.0...205.0) Del.quantity

: 5.00 Spread cm3 1000 : (9.00)

#### RATED SPEED

1st version Control Lever

position degrees: 50...58

Testing:

1st rack travel in: 11.90 Speed rpm : 900...910 2nd rack travel in: 4.00

rpm : 1025...1055

4th rack travel in: 1100

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 7...15

Testing:

rpm : 275 Speed Minimum rack trave: 6.00 rpm : 325

Rack travel in mm : 4.50...4.70

Rack travel in mm: 2.00

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 850 1st speed

Rack travel in m: 12.90...13.00

rpm : 700 2nd speed

Rack travel in m: 13.60...13.70

3rd speed rpm : 600
Rack travel in m: 13.80...13.90
4th speed rpm : 500
Rack travel in m: 0.00...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rom hPa : 900 Pressure

Rack travel mm : 13.80...13.90

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 250

Rack travel in m: 11.20...11.30

3rd pressure hPa : 475

Rack travel in m: 12.90...13.30

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm

Del.quantity cm3/: 237.0...243.0 1000 s: (234.0...246.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0)

### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.90

rpm : 900...910 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 195.0...235.0 1000 s: (185.0...245.0) Rack travel in mm: 10.30...10.50

### LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)

Spread

cm3 : 8.00 1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11,1a16 Test sheet : 31.10.89 : 7.4.89 Edition Replaces Test oil : ISO-4113 Combination no. : 0 402 746 847 Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 Governor Governor design. : RQV325...850PA878-8K : 0 421 815 205 Governer no. Customer-spec, information Customer : MACK TRUCKS : E6 300 4VH Engine : 224.0 1st version kW : 1700 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. ., C . : 38...42 Overflow valve : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening 1997 pressure, bar : 207...210 Orifice plate diameter mm : 0,6 : 1 680 750 008 Test Lines

: 6.00x2.00x600

Rack travel in mm : 10.50 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance  $+ - \frac{1}{2} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 850 Rack travel in mm : 12.90...13.00 Del.quantity cm3/: 20.0...20.2 100 s: (19.7...20.5) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 325.0 Rack travel in mm : 4.5...4.7 Del.quantity cm3/ : 3.2...3.8 100 s: (3.0...4.0) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 325 : 1.20...1.40 travel mm rpm : 450 2nd speed : 2.80...3.10 travel mm rpm : 850 3rd speed : 6.20...6.40 travel mm 4th speed rpm: 1000 : 7.70...7.90 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm: 1100 Rack travel in mm: 7.00...13.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 850 Speed Aneroid pressure h: 900 Del.quantity : 200.0...202.0 1000 : (197.0...205.0)

: 2.75...2.85

: (2.70...2.90)

Prestroke mm

per values

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

Outside diameter

x Wall thickness

x Length mm

cm3: 5.00 Spread

1000 : (9.00)

### RATED SPEED

1st version Control lever

position degrees: 50...58

Testing:

1st rack travel in: 11.90 Speed rpm : 900...910 2nd rack travel in: 4.00

rpm : 1025...1055 Speed

4th rack travel in: 1100

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 7...15

Testing:

: 275 Speed rpm Minimum rack trave: 6.00 rpm : 325 Speed

Rack travel in mm : 4.50...4.70 Rack travel in mm : 2.00

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 850 1st speed

Rack travel in m: 12.90...13.00

: 700 2nd speed rom

Rack travel in m: 13.60...13.70

3rd speed rpm : 600

Rack travel in m: 13.80...13.90 h speed rpm : 500

4th speed rpm

Rack travel in m: 0.00...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 900 Pressure

: 13.80...13.90 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 250

Rack travel in m: 11.20...11.30 3rd pressure hPa : 475

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 600

Del.quantity cm3/: 237.0...243.0 1000 s: (234.0...246.0)

Spread cm3 : 8.00 1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 400 Del.quantity cm3/: 154.0...158.0

1000 s: (152.0...160.0)

### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.90 rpm : 900...910 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 195.0...235.0 1000 s: (185.0...245.0)

Rack travel in mm : 10.30...10.50

LOW IDLE

Speed man

Rack travel in mm : 4.50...4.70

Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

: MAC 11,1a17 : 31.10.89

Edition

Replaces

: 7.4.89

Test oil

: ISO-4113

Combination no. : 0 402 746 849

Injection pump

Pump designation : PES6F120A720RS7135

EP type number

: 0 412 726 807

Governor

Governor design. : RQV325...850PA878-10

Governer no.

: 0 421 815 209

Customer-spec. information

Customer

: MACK TRUCKS

Engine

: E6 275 4VH

1st version kW

: 202.0

Rated speed

: 1800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 101

Openina

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,6

Test Lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm

: 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order

: 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 850

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 325.0

Rack travel in mm : 4.5...4.7 Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 325

: 1.20...1.40 travel mm

2nd speed rpm : 450

: 2.80...3.10 travel mm

3rd speed

rpm : 850

: 6.20...6.40 travel mm

4th speed

rpm : 1000 : 7.70...7.90

travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 850

Aneroid pressure h: 900

: 183.0...185.0 Del.quantity 1000 : (180.0...188.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 50...58 Testing: 1st rack travel in: 10.90 rpm : 900...910 Speed 2nd rack travel in: 4.00 rpm : 1025...1055 Speed 4th rack travel in: 1100 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: : 275 Speed man Minimum rack trave: 6.40 rpm : 325 Speed Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 11.90...12.90 nd speed rpm : 700 Rack travel in m: 12.80...12.90 2nd speed rpm 3rd speed rpm : 600 Rack travel in m: 13.00...13.10 4th speed rpm : 500 Rack travel in m: 0.00...12.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 900 Pressure : 13.00...13.10 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.30...10.50 2nd pressure hPa : 225

Rack travel in m: 11.00...11.10

3rd pressure hPa : 385 Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 600 Speed rpm Del.quantity cm3/: 219.5...225.5 1000 s: (216.5...228.5) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.90 : 900...910 Speed rom STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 195.0...235.0 1000 s: (185.0...245.0) Rack travel in mm : 10.30...10.50 LOW IDLE Speed rpm Rack travel in mm : 4.50...4.70 Del.guantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

Test sheet : MAC 11,1a13 Edition : 31.10.89 : 2.5.89 Replaces Test oil : ISO-4113

: 0 402 746 851 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135 : 0 412 726 807

EP type number

Governor

Governor design. : RQV325...850PA848-25

: 0 421 815 208 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: E6 275 4VH Engine

: 202.0 1st version kW : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 850

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm: 4.5...4.7

Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.20...1.40 travel mm

2nd speed rpm : 450

: 2.80...3.10 : 850 travel mm

3rd speed rpm

: 6.20...6.40 travel mm

4th speed rpm : 1000

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1100 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

: 183.0...185.0 1000 : (180.0...188.0) Del.quantity : 5.00 cm3 Spread : (9.00) 1000 RATED SPEED 1st version Control Lever position degrees: 50...58 Testing: 1st rack travel in: 10.90 rpm : 900...910 Speed 2nd rack travel in: 4.00 Speed rpm : 1025...1055 4th rack travel in: 1100 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 7...15 Testing: rpm : 275 Speed Minimum rack trave: 6.40 Speed rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 11.90...12.00 rpm : 700 2nd speed Rack travel in m: 12.80...12.90 rpm : 600 3rd speed Rack travel in m: 13.00...13.10 4th speed rpm : 500 Rack travel in m: 0.00...12.80 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 900 Pressure : 13.00...13.10 Rack travel mm Measurement 1/min: 600 Speed

3rd pressure hPa : 385 Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 600 Del.quantity cm3/: 219.5...225.5 1000 s: (216.5...228.5) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.90 rpm : 900...910 Speed STARTING FUEL DELIVERY : 100 rpm Del.quantity cm3/: 195.0...235.0 1000 s: (185.0...245.0) Rack travel in mm : 10.30...10.50 LOW IDLE Speed rpm Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Rack travel in m: 11.00...11.10

Note remarks

: MAC 11,1a14 Test sheet : 31.10.89 Edition 2.5.89 Replaces : ISO-4113 Test oil

Combination no. : 0 402 746 852

Injection pump

Pump designation : PES6P120A720RS7157 EP type number : D 412 726 814

Governor

Governor design. : RQV325...900PA909K

: 0 421 815 210 Governer no.

Customer-spec. information

: MACK TRUCKS Customer

: E7-400 Engine

: 298.0 1st version kW : 1700 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 15.80...15.90

Del.guantity cm3/: 27.5...27.7

100 s: (27.2...28.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm: 4.7...4.9

Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 325 : 1.20...1.40 travel mm

rpm : 450 2nd speed

: 2.80...3.20 travel mm

3rd speed rpm : 650

: 5.60...5.80 travel mm

rpm : 900 4th speed

: 8.30...8.50 travel mm

: 1100 5th speed

: 10.30...10.80 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 1200

Del.quantity : 275.0...277.0 1000 : (272.0...280.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 58...66

Testina:

1st rack travel in: 14.80 rpm : 940...950 Speed

2nd rack travel in: 4.00

rpm : 1120...1150 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 7...15

Testina:

Speed rpm Minimum rack trave: 6.30 : 325 Speed rpm

Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 900 1st speed

Rack travel in m: 15.80...15.90

2nd speed rpm : 625
Rack travel in m: 15.20...15.30
3rd speed rpm : 700

Rack travel in m: 15.50...15.60 4th speed rpm : 500

Rack travel in m: 0.00...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

: 900 Speed rpm hPa : 1200 Pressure

Rack travel mm : 15.80...15.90

Measurement

1/min: 900 Speed

1st pressure hPa : -

Rack travel in m: 8.10...8.50 2nd pressure hPa : 325 Rack travel in m: 10.20...10.30

3rd pressure hPa : 790

Rack travel in m: 13.80...14.20

START CUT-OUT

1/min: 275 (285) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 625 Speed rpm

Del.quantity cm3/: 302.5...308.5 1000 s: (299.5...311.5)

cm3 : 8.00 1000 s: (12.0) Spread

Aneroid pressure h: -: 400 Speed rpm

Del.quantity cm3/: 157.5...161.5

1000 s: (155.5...163.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.80

rpm : 940...950 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 180.0...220.0

1000 s: (170.0...230.0)

Rack travel in mm : 10.40...10.60

LOW IDLE

Speed rpm

Rack travel in mm : 4.70...4.90

Del.quantity cm3/: 40.0...46.0

1000 s: (38.0...48.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

#### BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.75...2.85 : (2.70...2.90) Prestroke mm Note remarks Rack travel in mm : 10.50 : 1-5-3-6-2-4 : MAC 12,0 a4 Firing order Test sheet : 31.10.89 : 2.5.89 Edition Replaces : ISO-4113 Test oil : 0-60-120-180-240-300 Phasing Combination no. : 0 402 746 853 Tolerance + - ... 0.50 (0.75)Injection pump Pump designation : PES6P120A720RS7157 Time to cyl. no. : 1 EP type number : 0 412 726 814 BASIC SETTING Governor Governor design.: RQV325...900PA909-1K Governer no. : 0 421 815 211 1st speed rpm: 900 Rack travel in mm : 13.80...13.90 Customer-spec. information Customer : MACK TRUCKS Del.quantity cm3/: 23.3...23.5 Engine : E7-350 100 s: (23.0...23.8) 1st version kW : 261.0 cm3 : 0.5: 1800 Spread Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 Test oil 2nd speed Rack travel in mm: 4.7...4.9 inlet temp. .. C . : 38...42 Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8) Overflow valve cm3 : 0.8 100 s: (1.2) : 2 417 413 011 Spread Overflow quantity min. 1/h: 160...170 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly 1st speed rpm : 325 : 1.20...1.40 travel mm Opening | rpm : 450 pressure, bar : 207...210 2nd speed : 2.80...3.20 travel mm rpm : 650 Orifice plate 3rd speed : 5.60...5.80 diameter mm : 0,6 travel mm rpm : 900 4th speed : 8.30...8.50 travel mm : 1 680 750 008 : 1100 Test Lines 5th speed rom : 10.30...10.80 travel mm Outside diameter FULL LOAD DELIV. AT FULL LOAD STOP x Wall thickness : 5.00X2.00X600 x Length mm 1st version rpm : 900 (A) Injection pump setting values Speed Aneroid pressure h: 1200 Insp. values in parentheses : 233.5...235.5 Set equal delivery quant. Del.quantity 1000 : (230.5...238.5) cm3 : 5.00 per values

Spread

1000 : (9.00)

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

RATED SPEED

1st version Control Lever

position degrees: 58...66

Testina:

1st rack travel in: 12.80

Speed rpm: 940...950 2nd rack travel in: 4.00

rpm : 1080...1110 Speed

4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever position degrees: 7...15

Testina:

Speed rom

Minimum rack trave: 6.30 : 325 Speed rpm

Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 13.80...13.90

rpm : 625 2nd speed

Rack travel in m: 13.50...13.70 3rd speed rpm : 500 Rack travel in m: 11.50...11.90

Aneroid/Altitude

Compensator Test

1st version

Setting

: 900 Speed rpm hPa : 1200 Pressure

Rack travel mm : 13.80...13.90

Measurement

Speed 1/min: 900

1st pressure hPa : -Rack travel in m: 7.80...8.20

2nd pressure hPa : 325 Rack travel in m: 9.40...9.50

3rd pressure hPa : 685

Rack travel in m: 12.10...12.50

START CUT-OUT

1/min: 275 (285) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 625 Speed rpm

Del.quantity cm3/: 266.0...272.0 1000 s: (263.0...275.0)

cm3 : 8.00 1000 s: (12.0) Spread

Aneroid pressure h: -: 400 Speed rpm

Del.quantity cm3/: 153.0...157.0 1000 s: (151.0...159.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 940...950 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 10.10...10.30

LOW IDLE

Speed rpm

Rack travel in mm : 4.70...4.90

Del.quantity cm3/: 40.0...46.0

1000 s: (38.0...48.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension

3.0...3.2 mm.

Bow dimension:

Sliding-sleeve position = 37.0 mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MAC 16,0 a : 31.10.89 Test sheet Edition : 1.9.89 Replaces : ISO-4113 Test oil

Combination no. : 0 402 748 802

Injection pump

Pump designation : PES8P120A920/4LS7159

EP type number : 0 412 728 801

Governor

: RQV325...1050PA848-Governor design.

21K

: 0 421 815 201 Governer no.

Customer-spec. information Customer : MACK

Engine : EE9 502

: 368.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65

(3.50...3.70)

Rack travel in mm: 9.00...12.00

Firing order: 1-2-7-8-4-5-6-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 630 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.8...5.0

Del.quantity cm3/: 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.30...1.60 travel mm

: 450 2nd speed rpm

: 2.30...2.70 travel mm

3rd speed : 800 rpm

travel mm : 4.40...4.80

4th speed : 1050 rpm

: 6.90...7.10 travel mm

: 1200 5th speed rpm

: 8.90...9.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1220 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 630 Speed Aneroid pressure h: 1200 : 207.0...209.0 Del.quantity 1000 : (204.0...212.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 57...65 Testing: 1st rack travel in: 12.10 rpm : 1095...1105 2nd rack travel in: 4.00 Speed rpm : 1180...1210 4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 9...17 Testing: : 275 Speed rpm Minimum rack trave: 6.30 rpm : 325 Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Torque control curve - 1st version : 630 1st speed rom Rack travel in m: 11.90...12.00 rpm : 1050 2nd speed Rack travel in m: 13.10...13.30 3rd speed rpm : 500 Rack travel in m: 0.00...11.30 Aneroid/Altitude Compensator Test 1st version Setting rpm : 1050 hPa : 1200 : 1050 Speed Pressure : 13.10...13.20 Rack travel mm

Measurement 1/min: 1050 Speed 1st pressure hPa : - Rack travel in m: 8.40...8.80 2nd pressure hPa : 345 006

Rack travel in m: 9.90...10.00 3rd pressure hPa : 725 Rack travel in m: 12.00...12.40 START CUT-OUT 1/min: 280 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050
Del.quantity cm3/ : 202.0...208.0
1000 s: (199.0...211.0) cm3 : 10.00Spread 1000 s: (14.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.10 rpm : 1095...1105 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 140.0...180.0 1000 s: (130.0...190.0) Rack travel in mm : 9.30...9.70 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 40.0...46.0 1000 s: (38.0...48.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : CUM 8,3 D 7 : 13.10.89 Test sheet Edition : 10.02.89 Replaces : ISO-4113 Test oil Combination no. : 0 403 436 109 Injection pump Pump designation : PES6MW100/120RS1143 EP type number : 0 413 406 137 Governor Governor design.: RQV300...1050MW82-4 Governer no. : 0 420 083 168 Cust. part no. : 3915581 Customer-spec. information Customer : CUMMINS/US Engine : 6 CTA-830 : 175.0 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. .. C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 017 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.05...3.15 Prestroke mm

: (3.09...3.20)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 14.8...15.0

100 s: (14.6...15.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 7.7...7.9 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 1210 : 9.00...9.40 travel mm

rpm : 1100 2nd speed

travel mm : 7.90...8.10 rpm : 550 3rd speed

: 3.00...3.60 travel mm

rpm : 300 4th speed

: 1.10...1.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900

: 148.0...150.0 Del.quantity

1000 : (146.0...152.0) cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever Testing: Speed

position degrees: 42...50

1st rack travel in: 11.60 rpm : 1090...1100

2nd rack travel in: 4.00 Speed rpm : 1185...1215 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 10...18

Setting point w/out bumper spring

Speed rpm Rack travel in mm: 7.8

Testing:

Speed rpm Minimum rack trave: 9.30 Speed rpm : 300 Rack travel in mm : 7.70...7.90

Aneroid/Altitude Compensator Test

1st version Settina

: 500 Speed rom Pressure hPa : -

: 9.50...9.70 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : 300 Rack travel in m: 10.80...10.90

2nd pressure hPa : 520

Rack travel in m: 11.90...12.20

3rd pressure hPa : 900

Rack travel in m: 12.60...12.70

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700 Del.quantity cm3/: 145.5...148.5 1000 s: (143.0...151.0)

cm3 : 5.00

1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 78.0...80.0 1000 s: (76.9...82.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.60

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 215.0...225.0 1000 s: (212.0...228.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 7.70...7.90 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

: C.D.C. #3915581

Start-of-delivery mark/lock = 8.0, angular displacement of the cam after start of delivery of cylinder 1.

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.15...3.25 : (3.10...3.30)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Note remarks Test sheet : CUM 8,3 D12 Edition : 02.10.89 Replaces : 30.05.89 : ISO-4113 : 0-60-120-180-240-300 Test oil Phasing : 0 403 436 111 Tolerance + - ... : 0.50 (0.75)Combination no. Time to cyl. no. : 1 Injection bumb Pump designation : PES6MW100/120RS1143 : 0 413 406 137 BASIC SETTING EP type number Governor rpm: 1200 Governor design. : RQV350...1200MW82-6 1st speed : 0 420 083 184 Governer no. Rack travel in mm : 12.10...12.20 : 3916000 Cust, part no. Del.guantity cm3/: 13.8...14.0 Customer-spec. information 100 s: (13.6...14.2) : CUMMINS/US Customer : 6 CTA-830 Spread cm3 : 0.3Engine Rated speed : 2400 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Rack travel in mm: 7.1...7.3 Test oil Del.quantity cm3/: 1.2...1.6 100 s: (1.0...1.8) inlet temp..., C : 38...42 cm3 : 0.3Overflow valve Spread : 1 417 413 047 100 s: (0.5) (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 017 assembly GUIDE SLEEVE TRAVEL rpm : 1250 1st speed : 7.60...7.80 travel mm Opening : 207...210 rpm : 1350 pressure, bar 2rid speed : 8.60...9.00 travel mm rpm : 350 Orifice plate 3rd speed : 1.20...1.60 : 0.6 travel mm diameter mm rpm : 800 4th speed : 4.90...5.50 travel mm : 1 680 750 008 Test lines FULL LOAD DELIV. AT FULL LOAD STOP Outside diameter x Wall thickness 1st version Speed rpm: 1200 Aneroid pressure h: 700 : 6.00X2.00X600 x Length mm : 138.0...140.0 (A) Injection pump setting values Del.quantity 1000 : (136.0...142.0) Insp. values in parentheses : 3.50 Set equal delivery quant. Spread cm3 1000 : (6.00) per values \_\_\_\_ RATED SPEED BEGINNING OF DELIVERY

1st version

Test pressure, bar: 30...32

Control Lever position degrees: 42...50 Testina: 1st rack travel in: 11.10 rpm : 1240...1250 2nd rack travel in: 4.00 Speed rpm : 1370...1400 4th rack travel in: 1455 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 11...19 Setting point w/out bumper spring rpm Rack travel in mm: 7.2 Testina: Speed rpm : 100 Minimum rack trave: 9.00 Speed rpm : 350 Rack travel in mm : 7.10...7.30 CONSTANT REGULATION rpm : 360...500 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 12.10...12.20 rpm : 750 2nd speed Rack travel in m: 12.50...12.60 3rd speed rpm : 1000 Rack travel in m: 12.10...12.20 4th speed rpm : 900 Rack travel in m: 12.20...12.40 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -: 11.00...11.10 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 390 Rack travel in m: 11.40...11.50 2nd pressure hPa : 480 Rack travel in m: 11.90...12.20 3rd pressure hPa : 700 Rack travel in m: 12.50...12.60

1/min : 270 (280) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 750 Speed rpm Del.quantity cm3/: 139.0...142.0 1000 s: (136.5...144.5) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 108.0...110.0 1000 s: (106.0...112.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.10 rpm : 1240...1250 Speed STARTING FUEL DELIVERY Speed : 100 rom Del.quantity cm3/: 205.0...225.0 1000 s: (202.0...228.0) LOW IDLE Speed rpm : 350 Rack travel in mm : 7.10...7.30 Del.quantity cm3/: 12.0...16.0 1000 s: (10.0...18.0) cm3 : 3.50 Spread 1000 s: (5.50) Remarks: : C.D.C. #3916000 Start-of-delivery mark at 10, cam rotation angle after start of delivery, cylinder 1

START CUT-OUT

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 4,5 K : 03.11.89 Test sheet Edition Replaces : 30.05.89 : ISO-4113 Test oil Combination no. : 0 403 444 108 Injection pump Pump designation : PES4MW100/320RS1116 : 0 413 404 102 EP type number Governor Governor design. : RQV300...1100MW51 : 0 420 083 072 Governer no. Customer-spec, information Customer : VME : TD45 Engine 1st version kW : 88.5 : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. , C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina : 172...175 pressure, bar Test Lines : 1 680 750 014 Outside diameter x Wall thickness : 6.00x2.00x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

: 3.25...3.35

: (3.20...3.40)

per values

Prestroke mm

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Rack travel in mm : 9.00...12.00

: 0-90-180-270 Phasing Tolerance  $+ - \dots : 0.50 (0.75)$ BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 13.00...13.10 Del.quantity cm3/: 12.0...12.2 100 s: (11.8...12.4) cm3 : 0.3Spread 100 s: (0.6) rpm : 300.02nd speed Rack travel in mm : 5.8...6.D Del.quantity cm3/ : 1.3...1.7 100 s: (1.0...1.9) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1220 1st speed : 9.20...9.60 travel mm rpm : 1150 2nd speed : 8.40...8.60 travel mm 3rd speed : 420 rpm : 1.70...2.30 travel mm 300 4th speed rpm travel mm : 1.00...1.40 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1100 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 1000 : 120.0...122.0 Del.quantity 1000 : (118.0...124.0) : 3.50 cm3 Spread 1000 : (6.00)

RATED SPEED

Firing order

: 1-3-4-2

1st version Spread cm3 : 5.501000 s: (7.0) Control lever Aneroid pressure h: position degrees: 48...56 rpm : 700 Speed Del.quantity cm3/: 85.0...87.0 1000 s: (83.0...89.0) Testing: 1st rack travel in: 12.00 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 Speed rpm : 1200...1230 4th rack travel in: 1350 **BREAKAWAY** rpm : 0.00...1.001st version Speed 1mm rack travel less than LOW IDLE 1 full load rack tr: 12.00 Control Lever rpm : 1140...1150 position degrees: 8...16 Speed Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.9 STARTING FUEL DELIVERY Speed rpm : 100 Testing: Del.quantity cm3/: 130.0...140.0 : 100 Speed rpm 1000 s: (127.0...143.0) Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 5.80...6.00 LOW IDLE Speed rpm : 300 Rack travel in mm : 5.80...6.00 CONSTANT REGULATION rpm : 330...450 Speed Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5) Aneroid/Altitude cm3 : 3.50Spread Compensator Test 1000 s: (5.50) 1st version Remarks: Setting : : 700 Speed rpm hPa : 520 Pressure : 12.90...13.00 Rack travel mm Measurement 1/min: 700 Speed 1st pressure hPa : -Rack travel in m: 11.00...11.10 2nd pressure hPa : 275 Rack travel in m: 11.10...11.40 3rd pressure hPa : 1000 Rack travel in m: 13.00...13.10 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 : 1000 rpm Speed Del.quantity cm3/: 118.5...121.5 1000 s: (116.0...124.0)

#### Note remarks

: VOL 4,5 L 1 : 03.11.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 403 444 109

Injection pump

Pump designation : PES4MW100/320RS1116

: 0 413 404 102 EP type number

Governor

Governor design. : RQV300...1100MW39-6

: 0 420 083 087 Governer no.

Customer—spec. information

Customer : VME

: TD45 Engine

: 69.0 1st version kW : 2200 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.25...3.35 Prestroke mm

: (3.20...3.40)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 8.5...8.7

100 s: (8.3...8.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1225 1st speed

: 9.40...9.80 travel mm

rpm : 1150 2nd speed

travel mm : 8.30...8.50

3rd speed rpm : 600

: 2.70...3.30 travel mm

rpm : 300 4th speed

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1130 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 85.0...87.0 Del.quantity 1000 : (83.0...89.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 44...52 Testing: 1st rack travel in: 9.70 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 10...18 Setting point w/out bumper spring rpm Rack travel in mm: 5.9 Testing: : 100 Speed rpm Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm : 5.80...6.00 CONSTANT REGULATION rpm : 330...450 Speed START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version : 1000 Speed rpm Del.quantity cm3/: 87.5...90.5 1000 s: (85.0...93.0) cm3 : 5.50 Spread 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.70 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...140.0

1000 s: (127.0...143.0)

: 300

rpm

Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

•

D14

Speed

LOW IDLE

Note remarks

Test sheet : VOL 4,5 L Edition : 03.11.89 Replaces : 07.04.89 Test oil : ISO-4113

Combination no. : 0 403 444 111

Injection pump

Pump designation : PES4MW100/320RS1116

: 0 413 404 102 EP type number

Governor

Governor design. : RQV300...1100MW39-5

: 0 420 083 068 Governer no.

Customer-spec. information Customer : VME

: TD45 Engine

1st version kW : 88.5 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp., C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 173...176 pressure, bar

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10

: (2.95...3.15) Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 11.7...11.9

100 s: (11.5...12.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.3...1.7 100 s: (1.0...1.9)

cm3 : 0.3 100 s: (0.5) Spread

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1225 : 9.40...9.80 travel mm rpm : 1150

2nd speed : 8.30...8.50 travel mm

rpm : 600 3rd speed : 2.70...3.30

travel mm rpm : 300 4th speed

: 1.00...1.40 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Del.quantity : 117.0...119.0 1000 : (115.0...121.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 44...52 Testina: 1st rack travel in: 12.00 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1225...1255 Speed 4th rack travel in: 1350 rom : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Setting point w/out bumper spring rpm Rack travel in mm: 6.5 Testina: Speed rpm : 100 Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.40...6.60 CONSTANT REGULATION rpm : 320...450 Speed

FUEL DELIVERY CHARACTERISTICS

1st version : 1000 Speed rpm Del.quantity cm3/: 115.5...118.5

1000 s: (113.0...121.0)

cm3 : 5.50Spread 1000 s: (7.0)

RACK STOP ADJUSTMENT

Speed rpm : 100

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.00 rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 150.0...160.0 1000 s: (147.0...163.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.40...6.60 Del.quantity cm3/ : 13.0...17.0

1000 s: (10.5...19.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

Note remarks

Test sheet : MB 4,0 A 30 Edition : 02.10.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 444 116

Injection pump

Pump designation : PES4MW100/720RS1127

EP type number : 0 413 404 103

Governor

Governor design. : RQV300...1400MW48-7

Governer no. : 0 420 083 172

Customer—spec. information Customer : MB-NFZ

Engine : OM 364A

1st version kW : 70.0 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1400

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 6.7...6.9

100 s: (6.5...7.1)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 0.9...1.3

Del.quantity cm3/: 0.9...1.3 100 s: (0.6...1.5)

Spread cm3 : 0.3 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.00...9.40 2nd speed rpm : 1450

travel mm : 8.20...8.40

3rd speed rpm : 550 travel mm : 2.80...3.40

4th speed rpm: 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm: 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1400

Del.quantity : 67.0...69.0 1000 : (65.0...71.0)

Spread cm3 : 3.50

1000 : (6.00)

1000 : (0.00)

RATED SPEED

1st version

Control lever position degrees: 48...56 Testina: 1st rack travel in: 9.50 rpm : 1450...1460 Speed 2nd rack travel in: 4.00 rpm : 1540...1570 Speed 4th rack travel in: 1650 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 8.0 Testing: : 100 Speed rpm Minimum rack trave: 9.50 Speed rpm : 300 Rack travel in mm : 7.90...8.10 TORQUE CONTROL Torque control curve - 1st version rpm : 1400 1st speed Rack travel in m: 10.00...10.10 2nd speed : 750 rpm Rack travel in m: 10.80...10.90 3rd speed rpm : 950 Rack travel in m: 10.60...10.90 th speed rpm : 1100 4th speed Rack travel in m: 10.20...10.50 START CUT-OUT 1/min: 200 (230) Speed FUEL DELIVERY CHARACTERISTICS 1st version : 750 Speed rpm Del.quantity cm3/: 60.0...62.0 1000 s: (57.0...65.0) cm3 : 5.00 Spread 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1450...1460 Speed

rpm : 100 Speed Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0) LOW IDLE : 300 Speed rpm Rack travel in mm: 7.90...8.10
Del.quantity cm3/: 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3: 3.50 1000 s: (5.50) Remarks:

STARTING FUEL DELIVERY

Note remarks

Test sheet : MB 4.0 A 29 Edition : 02.10.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 444 117

Injection pump

Pump designation : PES4MW100/720RS1127

EP type number : 0 413 404 103

Governor

Governor design. : RQV300...1400MW48-10

Governer no. : 0 420 083 178

Customer—spec. information Customer : MB-NFZ

Engine : OM 364A

1st version kW : 85.0 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C . : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + -., : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1400

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 7.9...8.1

100 s: (7.7...8.3)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 8.9...9.1 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.00...9.40 2nd speed rpm : 1450

travel mm : 8.30...8.50

4th speed rpm: 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -1

Speed rpm: 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1400

Del.quantity : 79.0...81.0 1000 : (77.0...83.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 48...56 Testina: 1st rack travel in: 10.50 Speed rpm : 1440...1450 2nd rack travel in: 4.00 Speed rpm : 1540...1570 4th rack travel in: 1650 Speed Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 9.0 Testing: rpm : 100 Speed Minimum rack trave: 10.50 Speed rpm : 300 Rack travel in mm : 8.90...9.10 TORQUE CONTROL Dimension a mm : 1.30 Torque control curve - 1st version 1st speed rpm : 1400 Rack travel in m: 11.50...11.60 rpm : 750 2nd speed Rack travel in m: 12.80...12.90 3rd speed rpm : 950 Rack travel in m: 12.40...12.60 4th speed rpm : 1100 Rack travel in m: 12.00...12.30 START CUT-OUT 1/min : 200 (230) Speed FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750
Del.quantity cm3/ : 75.0...77.0
1000 s: (73.0...79.0) cm3 : 5.00Spread 1000 s: (7.0) BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.50 rpm : 1440...1450 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 78.0...88.0

1000 s: (75.0...91.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 8.90...9.10 Del.quantity cm3/: 9.0...13.0 1000 s: (6.5...15.5)

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

### Note remarks

: MB 6,0 D 47 Test sheet : 13.06.88 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 156

Injection pump

Pump designation : PES6MW100/720RS1120

EP type number : 0 413 406 112

Governor

Governor design. : RQV300...1300MW59

Governer no. : 0 420 083 077

Customer-spec. information

Customer : DB

: 0M366LA Engine

1st version kW : 141.7 Rated speed : 2600

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening .

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 3.50...3.60 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rom: 1300

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 6.0...6.1 Del.quantity cm3/: 0.9...1.3

100 s: (0.7...1.5)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1450 1st speed

: 9.50...9.90 travel mm

rpm : 1350 2nd speed

travel mm : 8.50...8.70

rpm : 450 3rd speed

: 2.40...3.00 travel mm

rpm : 300 4th speed

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1300 Aneroid pressure h: 700

: 86.0...88.0 Del.quantity 1000 : (84.0...90.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 48...56 Testing: 1st rack travel in: 11.10 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 Speed rpm : 1440...1470 4th rack travel in: 1530 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 16...24 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.0 Testing: rpm : 100 Speed Minimum rack trave: 8.00 rpm : 300 Rack travel in mm : 6.00...6.10 CONSTANT REGULATION rpm : 320...550 Speed Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 260 mm : 11.00...11.10 Speed rpm Pressure Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : 700 Rack travel in m: 12.00...12.10 2nd pressure hPa : -Rack travel in m: 10.80...10.90 3rd pressure hPa : 310 Rack travel in m: 11.70...12.00 START CUT-OUT 1/min: 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

rpm : 750

Del.quantity cm3/: 75.5...78.5 1000 s: (73.0...81.0)

cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 47.0...49.0 1000 s: (45.0...51.0)

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.10

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 83.0...93.0 1000 s: (80.0...96.0)

### LOW IDLE

rpm : 300 Speed Rack travel in mm: 6.00...6.10 Del.quantity cm3/: 9.0...13.0 1000 s: (7.0...15.0) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

Speed

#### Note remarks

: MB 6,0 D 26 Test sheet Edition : 06.10.89 : 29.04.88 Replaces : ISO-4113 Test oil

Combination no. : 0 403 446 177

Injection pump

Pump designation : PES6MW100/720RS1144

EP type number : 0 413 406 138

Governor

Governor design. : RQV300...1300MW48 Governer no. : 0 420 083 066

Customer-spec. information : DB Customer

: 0M366A Engine

: 125.0 1st version kW Rated speed : 2600

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rom: 1300

Rack travel in mm: 11.00...11.10

Del.quantity cm3/: 7.7...7.9

100 s: (7.5...8.1)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 7.8...7.9 Del.quantity cm3/: 0.9...1.3 100 s: (0.6...1.5)

cm3 : 0.3

Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1430

: 9.30...9.70 travel mm rpm : 1340

2nd speed

travel mm : 8.50...8.70 rpm : 500 : 2.70...3.30 3rd speed

travel mm rpm : 300 4th speed

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1280 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

: 77.0...79.0 Del.quantity 1000 : (75.0...81.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control Lever position degrees: 50...58 Testing: 1st rack travel in: 10.00 rpm : 1340...1350 2nd rack travel in: 4.00 Speed rpm : 1425...1455 4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring : 300 rpm Rack travel in mm: 7.8 Testina: rpm : 100 Speed Minimum rack trave: 8.70 rpm : 300 Speed Rack travel in mm : 7.80...7.90 CONSTANT REGULATION rpm : 330...500 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 11.00...11.10 : 800 2nd speed rom Rack travel in m: 11.80...12.00 rpm : 585 3rd speed Rack travel in m: 12.00...12.20 4th speed rpm : 1100 Rack travel in m: 11.00...11.10 START CUT-OUT 1/min: 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version : 800 Speed rpm Del.quantity cm3/: 76.0...78.0 1000 s: (74.0...80.0) Spread cm3 : 5.001000 s: (7.0) : 585 Speed rpm Del.quantity cm3/: 68.5...71.5 1000 s: (66.0...74.0) cm3 : 5.00 Spread 1000 s: (7.00)

1st version 1mm rack travel less than full load rack tr: 10.00 Speed rpm : 1340...1350 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 7.80...7.90 Del.quantity cm3/ : 9.0...13.0 1000 s: (6.5...15.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

Note remarks

Test sheet : MB 6,0 0 77 Edition : 02.10.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 446 225

Injection pump

Pump designation : PES6MW100/720RS1144-

1

EP type number : 0 413 406 159

Governor

Governor design. : RQV300...1400MW48-11

Governer no. : 0 420 083 190

Customer—spec. information Customer : MB—NFZ

Engine : OM366A

1st version kW : 125.0 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening 1

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1400

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 7.5...7.7

100 s: (7.3...7.9)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...8.3 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1550

travel mm : 9.20...9.60

2nd speed rpm: 1450

travel mm : 8.30...8.50

3rd speed rpm: 550

travel mm : 2.80...3.40

4th speed rpm: 300

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-Lever position
Degree: -1

Speed rpm: 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1400

Del.quantity : 75.0...77.0 1000 : (73.0...79.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 48...56 Testing: 1st rack travel in: 9.90 rpm : 1440...1450 Speed 2nd rack travel in: 4.00 rpm : 1530...1560 Speed 4th rack travel in: 1650 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 8.0 Testing: : 100 Speed rpm Minimum rack trave: 9.50 : 300 man Rack travel in mm : 7.80...8.30 TORQUE CONTROL Dimension a mm : 0.60 Torque control curve - 1st version 1st speed rpm : 1400 Rack travel in m: 10.90...11.00 2nd speed rpm : 800 Rack travel in m: 11.50...11.70

3rd speed rpm : 1000

Rack travel in m: 11.10...11.40 START CUT-OUT 1/min: 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version : 800 Speed rpm Del.quantity cm3/: 67.5...70.5 1000 s: (65.0...73.0) cm3 : 5.00Spread 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.90 rpm : 1440...1450 Speed

Speed rpm : 100 Del.quantity cm3/ : 80.0...90.0 1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...8.30
Del.quantity cm3/: 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

STARTING FUEL DELIVERY

#### Note remarks

Test sheet : MB 6,0 D 71 : 13.10.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 226

Injection pump

: PES6MW100/720RS1131-Pump designation

EP type number : 0 413 406 165

Governor

Governor design. : RQ300/1300MW105 : 0 420 082 039 Governer no.

Customer-spec. information Customer : DB-NKW

: 0M366LA Engine

: 177.0 1st version kW : 2600 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 14.60...14.70

Del.quantity cm3/: 12.0...12.2

100 s: (11.8...12.4)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

: 9.70...10.10 travel mm

: 1360 2nd speed rpm

: 7.20...7.40 travel mm 520

3rd speed rpm : : 4.00...4.60 travel mm

rpm : 300 4th speed

: 1.30...1.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 1200 Speed

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed Aneroid pressure h: 1000

: 120.0...122.0 Del.quantity 1000 : (118.0...124.0)

cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version Control Lever position degrees: 38...46 Setting point: Speed rpm Rack travel in mm: 15.5 Testing: 1st rack travel in: 13.60 rpm : 1345...1360 Speed 2nd rack travel in: 4.00 rpm : 1450...1480 Speed 4th rack travel in: 1550 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 8...16 Setting point w/out bumper spring Speed rpm Rack travel in mm: 6.4 Testing: Speed : 100 rpm Minimum rack trave: 9.00 rpm : 300 Speed Rack travel in mm : 6.30...6.50 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom Pressure hPa : -: 10.60...10.70 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 200 Rack travel in m: 10.90...11.10
2nd pressure hPa : 500
Rack travel in m: 13.50...13.70
3rd pressure hPa : 1000 Rack travel in m: 14.60...14.70

Del.quantity cm3/: 111.0...115.0 1000 s: (109.0...117.0) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 41.0...43.0 1000 s: (39.0...45.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 1345...1360 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 100.0...110.0 1000 s: (97.0...113.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50Spread 1000 s: (5.50) Remarks:

Speed

Speed

START CUT-OUT

1st version

1/min: 180 (200)

FUEL DELIVERY CHARACTERISTICS

rpm : 750

Aneroid pressure h: 1000

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : IHC 7,6 U : 13.10.89 Test sheet Edition Replaces : ISO-4113 Phasing : 0-60-120-180-240-300 Test oil Combination no. : 0 403 446 227 Tolerance + --, .: 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1182 : D 413 406 167 rpm: 800 EP type number 1st speed Governor Rack travel in mm : 12.90...13.00 Governor design. : RQV350...1200MW46-19 : 0 420 083 191 Governer no. Del.quantity cm3/: 13.6...13.8 Customer-spec. information 100 s: (13.4...14.0) : NAVISTAR Customer cm3 : 0.3: DTA-466 Spread Engine 100 s: (0.6) : 182.0 1st version kW : 2400 Rated speed rpm : 350.0 2nd speed Rack travel in mm: 6.3...6.5 TEST BENCH REQUIREMENTS Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) Test oil cm3 : 0.3 inlet temp. ., C . : 38...42 Spread 100 s: (0.5) Overflow valve : 2 417 413 038 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL rpm : 1350 Test nozzle holder 1st speed : 8.30...8.50 : 1 688 901 101 assembly travel mm rpm : 1460 2nd speed : 9.10...9.50 Openina | travel mm : 207...210 rpm : 550 pressure, bar 3rd speed : 3.10...3.70 rpm : 350 : 1.30...1.70 travel mm Orifice plate 4th speed diameter mm : 0,6 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test Lines : 1 680 750 008 1st version Outside diameter rpm : 800 Speed Aneroid pressure h: 800 x Wall thickness : 136.5...138.5 : 6.00X2.00X600 Del.quantity x Length mm 1000 : (134.5...140.5) : 3.50 (A) Injection pump setting values cm3 Spread 1000 : (6.00) Insp. values in parentheses Set equal delivery quant.

RATED SPEED

1st version Control lever

position degrees: 43...51

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Testing: 1st rack travel in: 11.90 rpm : 1260...1280 Speed 2nd rack travel in: 4.00 : 1395...1405 Speed rpm 4th rack travel in: 1500 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 8...16 Setting point w/out bumper spring rpm Rack travel in mm: 6.4 Testing: Speed rpm : 100 Minimum rack trave: 9.00 : 350 Speed rpm Rack travel in mm : 6.30...6.50 CONSTANT REGULATION rpm : 300...450 Speed Aneroid/Altitude Compensator Test 1st version Setting : 800 Speed rpm hPa : 220 Pressure : 11.00...11.10 Rack travel mm Measurement Speed 1/min: 800 1st pressure hPa :-Rack travel in m: 10.20...10.40 2nd pressure hPa : 450 Rack travel in m: 12.10...12.40 3rd pressure hPa : 800 Rack travel in m: 12.90...13.00 START CUT-OUT 1/min: 180 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800 rpm\_ : 1200 Del.quantity cm3/: 133.0...137.0 1000 s: (131.0...139.0)

cm3 : 6.50

1000 s: (7.0)

Speed rpm : 500 Del.quantity cm3/ : 88.0...90.0 1000 s: (86.0...92.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90 Speed rpm : 1260...1280

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter. Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

Spread

Aneroid pressure h: -

Note remarks

Test sheet : IHC 7,6 U 1 Edition : 02.10.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 446 228

Injection pump

Pump designation : PES6MW100/320RS1182

EP type number : 0 413 406 167

Governor

Governor design. : RQV350...1300MW46-20

Governer no. : 0 420 083 192

Cust. part no. : 1815267091

Customer—spec. information Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 2 417 413 038

Inlet press., bar: 2.80

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10

: (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - ., .: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 6.2...6.4 Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1460

travel mm : 9.10...9.50

2nd speed rpm: 1350

travel mm : 8.30...8.50

3rd speed rpm : 550 travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 900

Aneroid pressure h: 800

Del.quantity : 119.0...121.0 1000 : (117.0...123.0)

id cm3 : 3.50

Spread cm3 : 3.50 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.90

rpm : 1360...1380 Speed

2nd rack travel in: 4.00

rpm : 1480...1490 Speed

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 9...17

Setting point w/out bumper spring

rpm : 350 Rack travel in mm: 6.3

Testing:

Speed rpm : 100

Minimum rack trave: 9.00 rpm : 350

Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

rpm : 300...450 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 800 Pressure

: 11.90...12.00 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 10.20...10.30

2nd pressure hPa : 165
Rack travel in m: 10.70...10.80
3rd pressure hPa : 360

Rack travel in m: 11.30...11.60

START CUT-OUT

1/min: 180 (200) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 Speed : 1300 rpm

Del.quantity cm3/: 120.0...123.0 1000 s: (117.5...125.5) Spread cm3 : 5.00 1000 s: (7.0)

Aneroid pressure h: -

rpm\_ : 500 Speed

Del.quantity cm3/: 88.0...90.0 1000 s: (86.0...92.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 1360...1380 Speed

STARTING FUEL DELIVERY

rpm\_ : 100 Speed

Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 14.0...18.0 1000 s: (11.5...20.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

: I.H.C. #1815267C91

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter. Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before

shutoff.

Note remarks

: IHC 7,6 U 2 Test sheet : 02.10.89 Edition

Replaces

: ISO-4113 Test oil

: 0 403 446 229 Combination no.

Injection pump

Pump designation : PES6MW100/320RS1182

: 0 413 406 167 EP type number

Governor

Governor design. : RQV350...1200MW64-1

Governer no. : 0 420 083 193

Cust. part no. : 1815224C91

Customer-spec. information Customer : NAVISTAR

Engine : DTA-466

1st version kW : 164.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 2 417 413 038

Inlet press., bar: 2.80

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Phasing

Tolerance + - ., .: 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 350.02nd speed

Rack travel in mm: 6.2...6.4 Del.quantity cm3/: 1.4...1.8

100 s: (1.1...2.0)

cm3 : 0.3Spread

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1350 1st speed

: 8.30...8.50 travel mm

rpm : 1460 2nd speed

: 9.10...9.50 travel mm

rpm : 550 3rd speed

: 3.10...3.70 rpm : 350 travel mm

4th speed

: 1.30...1.70 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200 Aneroid pressure h: 800

: 119.5...121.5 Del.quantity

1000 : (117.5...123.5)

cm3 : 3.50

1000 : (6.00)

RATED SPEED

Spread

1st version

Control lever position degrees: 43...51 Testina: 1st rack travel in: 10.90 rpm : 1255...1275 Speed 2nd rack travel in: 4.00 : 1375...1385 Speed rpm 4th rack travel in: 1500 rom : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 10...18 Setting point wout bumper spring rpm Rack travel in mm: 6.3 Testina: Speed : 100 rpm Minimum rack trave: 9.00 : 350 Speed rpm Rack travel in mm : 6.20...6.40 CONSTANT REGULATION rpm : 360...450 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 11.90...12.00 : 800 2nd speed rpm Rack travel in m: 12.20...12.30 rom : 1150 3rd speed Rack travel in m: 11.90...12.00 4th speed rpm : 950 Rack travel in m: 12.20...12.30 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 215 Pressure Rack travel mm : 10.90...11.00 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 10.40...10.50 2nd pressure hPa : 400 Rack travel in m: 11.70...12.00 3rd pressure hPa : 800

Rack travel in m: 12.20...12.30

1/min: 280 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800 : 800 rpm Del.quantity cm3/: 122.0...126.0 1000 s: (120.0...128.0) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 91.0...93.0 1000 s: (89.0...95.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.90 rpm : 1255...1275 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 14.0...18.0 1000 s: (11.5...20.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks: : I.H.C. #1815224C91 overflow valve without IH hose and restrictor 1.2 mm diameter. Before checking sleeve position,

Only perform pump setting with original first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

START CUT-OUT

#### Note remarks

Test sheet : MB 8,7 p 2 Edition : 20.6.88 : 12.9.86 Replaces Test oil : ISO-4113

Combination no. : 0 403 546 008

Injection pump

Pump designation : PE6MW100/720RS1126

EP type number : 0 413 506 101

Governor

Governor design.: RQ300/1250MW12-2

: 0 420 082 020 Governer no.

Customer-spec. information

: DAIMLER BENZ Customer

Engine : 0M360A

: 147.00 1st version kW : 2500 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C . : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
Prestroke mm : 3.80...3.90
: (3.75...3.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 9.70...9.90

100 s: (9.50...10.10)

cm3 : 0.35Spread

100 s: (0.60)

rpm : 300 2nd speed

Rack travel in mm : 8.60...8.70 Del.quantity cm3/: 1.00...1.40 100 s: (0.70...1.60) Spread cm3: 0.35

100 s: (0.50)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -2

rpm : 650 Speed

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

: 97.00...99.00 Del.quantity

1000 : (95.0...101.0)

cm3 : 3.50 1000 : (6.00) Spread

RATED SPEED

1st version

Setting point:

Speed rom : 650 Rack travel in mm: 13.5

Testing:

1st rack travel in: 11.90

rpm : 1295...1310 Speed

2nd rack travel in: 4.00

rpm : 1415...1445 Speed 3rd rack travel in: 0.10...1.00

rpm : 1550 Speed

LOW IDLE 1

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 8.60...8.70

Testing: Speed Speed rpm: 220
Minimum rack trave: 10.40
Speed rpm: 300
Rack travel in mm: 8.60...8.70
Rack travel in mm: 2.00
Speed rpm: 430...470

Remarks:

#### Note remarks

Test sheet : YDA 7,3 d Edition : 08.08.89

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 030 451

Injection pump

Pump designation : PES6A95D310/3LS2636

Governor

Governor design. : RSV250...900A7B685L

Customer-spec. information

Customer : RUSTON & HORNSBY

Engine : 6 YDX MK 2

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.5

Test nozzle holder

assembly : 0 681 343 009

Opening |

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6,00x1,50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_\_

### BEGINNING OF DELIVERY

Prestroke mm : 2,15...2,25 : (2,10...2,30) Rack travel in mm : 9,00...12,00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - . . . . . . . 0,50 (0,75)

### BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 9,00

Del.quantity cm3/: 6,2...7,7

100 s: (-)

Spread cm3 : 0.4

100 s: (-)

2nd speed rpm : 200 Rack travel in mm : 6,00 Del.quantity cm3/ : 0,4...1,5

100 s: (-)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800

Rack travel in mm : 0,30...0,70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 750

Del.quantity : 121,0...123,0 1000 : (119,0...125,0)

RATED SPEED

1st version Control lever

position degrees: 38...46

Testing:

1st rack travel in: 11.0
Speed rpm : 760...765
2nd rack travel in: 5.50
Speed rpm : <790

4th rack travel in: 930

Speed rpm : 0,30...1,70

LOW IDLE 1 Control lever

position degrees: 8...16

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm : 6,00

Testina:

Speed rpm : 100 Minimum rack trave: 17,00 Speed rpm : 250
Rack travel in mm : 5,80...6,20
Rack travel in mm : 2,00
Speed rpm : 420...470

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 8,00 Speed rpm : 760...765

# HIGH IDLE

1st version

Speed Speed rpm : <800 Rack travel in mm : 5,50

Remarks:

Note remarks

: MWM 3,9 a Test sheet Edition : 15.08.89 Replaces : 4.85 : ISO-4113 Test oil

: 9 400 085 240 Combination no.

Injection pump

Pump designation : PES4A90D320RS2702 EP type number : 9 400 083 095

Governor

Governor design. : RSV350...1150A2B2129

-4R

: 9 420 083 193 Governer no.

Customer-spec. information Customer

: D 229-4 Engine

: 75.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.65...2.75 Prestroke mm

: (2.60...2.80)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00 & maximum rack tra: 21.00

Difference ., CS : 3.00...4.00

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 9.00...9.10

Del.guantity cm3/: 6.3...6.4

100 s: (6.1...6.5)

cm3 : 0.3Spread

100 s: (0.5)

2nd speed rpm : 350.0 Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 1.0...1.4

100 s: (0.8...1.6)

cm3 : 0.2 Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

: 63.5...64.5 Del.quantity 1000 : (61.5...66.5)

: 3.00 cm3 Spread

1000 : (5.00)

RATED SPEED

1st version

Control Lever position degrees: 45...53 Testing: 1st rack travel in: 8.00 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 rpm : 1230...1260 Speed 4th rack travel in: 1400 Speed rpm : 0.30...1.70LOW IDLE 1 Control Lever position degrees: 20...28 Setting point w/out bumper spring rom Rack travel in mm : 5.2 Testing: rpm : 100 Speed Minimum rack trave: 19.00 rpm : 350 Speed Rack travel in mm : 5.60...5.80 Rack travel in mm : 2.00 rom : 560...620 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1150 1st speed Rack travel in m: 9.00...9.10 2nd speed rpm : 500 Rack travel in m: 10.10...10.20 3rd speed rpm : 800 Rack travel in m: 9.70...9.90 4th speed rpm : 1000 Rack travel in m: 9.10...9.40 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 61.0...63.0 1000 s: (59.5...64.5) rpm : 800 Speed Del.quantity cm3/: 66.0...68.0 1000 s: (63.5...70.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 8.00 rpm : 1190...1200 Speed

Speed rpm : 100
Rack travel in mm : 19.00...21.00
Remarks:
: VALMET
APPLICATION
Tractor (tractor engines)

STARTING FUEL DELIVERY

#### Note remarks

Test sheet : MB 6,0 e Edition : 01.09.88 : 8.1.88 Replaces Test oil : ISO-4113

Combination no. : 9 400 085 288

Injection pump

Pump designation : PES6A90D410RS2596-1

EP type number : 9 400 084 008

Governor

Governor design. : RQV300...1300AB1066-

: 9 420 080 230 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: OM 366 A Engine

1st version kW : 127.0 : 2600 Rated speed

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 8.6...8.7

100 s: (8.4...8.9)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 300.0 Rack travel in mm : 8.4...8.6 Del.quantity cm3/ : 1.0...1.4

100 s: (0.8...1.6)

cm3 : 0.2Spread 100 s: (0.4)

## (B) Setting of injection pump with governor

# GUIDE SLEEVE TRAVEL

rpm : 1375 1st speed

: 8.40...8.50 travel mm rpm : 300 2nd speed : 0.90...1.30 travel mm

rpm : 500 3rd speed

: 2.20...2.60 travel mm

rpm : 800 4th speed

travel mm : 4.30...4.70 rpm : 1100 5th speed

: 6.10...6.40 travel mm

# GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1375

Rack travel in mm : 15.20...17.80

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rom : 1300 Speed Aneroid pressure h: 1000

cm3 Spread : 3.00

1000 : (5.00)

### RATED SPEED

1st version Control Lever

position degrees: 60...68

Testing:

1st rack travel in: 12.10

rpm : 1340...1350 Speed

2nd rack travel in: 4.00

: 1470...1500 Speed rpm

4th rack travel in: 1600

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 19...27

Testing:

: 100 Speed man Minimum rack trave: 10.00 rpm : 300 Speed

Rack travel in mm : 8.40...8.60 Rack travel in mm : 2.00

Speed : 570...630 rom

CONSTANT REGULATION

Speed rpm : 590...660

TORQUE CONTROL

Dimension a mm : 1.00

Torque control curve - 1st version

1st speed

st speed rpm : 1300 Rack travel in m: 13.10...13.20

: 800 2nd speed rpm

Rack travel in m: 14.10...14.20

rpm : 1000 3rd speed

Rack travel in m: 13.90...14.10

4th speed rpm : 1150

Rack travel in m: 13.30...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1000 Pressure

Rack travel mm : 14.10...14.20

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 12.80...12.90

2nd pressure hPa : 750

Rack travel in m: 13.90...14.00

3rd pressure hPa : 650

Rack travel in m: 13.20...13.40

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm : 800 Speed

Del.quantity cm3/: 89.0...91.0 1000 s: (86.5...93.5)

Aneroid pressure h: 1000

Speed rpm: 1000 Del.quantity cm3/: 90.0...92.0 1000 s: (87.5...94.5)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 66.5...68.5 1000 s: (64.5...70.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.10

rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 71.0...81.0

1000 s: (68.0...84.0)

Rack travel in mm : 14.70...15.70

Remarks:

E14

Note remarks

Test sheet : FOR 6,6 L 1 : 02.05.89 Edition : 1.9.88 Replaces : ISO-4113 Test oil

Combination no. : 9 400 085 298

Injection pump

Pump designation : PES6A95D410RS2758 : 9 400 084 016 EP type number

Governor

: RQV350...1300AB1220-Governor design.

: 9 420 080 253 Governer no.

Customer-spec. information : FORD FNH Customer

: 6,6 L Engine

1st version kW : 123.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.15...3.25 Prestroke mm : (3.10...3.30)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1300

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 7.1...7.3 Del.guantity cm3/: 2.0...2.4 100 s: (1.7...2.6)

cm3 : 0.3Spread

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1335 1st speed

: 8.00...8.10 travel mm rpm : 350

2nd speed : 1.20...1.60 travel mm

rpm : 500 3rd speed

travel mm

: 2.90...3.30

rpm : 1000 4th speed : 5.30...5.70 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1530 Speed

Rack travel in mm: 8.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rom : 1300Speed Aneroid pressure h: 900

Del.quantity : 98.0...102.0) cm3 : 3.50 1000 : (6.00) RATED SPEED 1st version Control Lever position degrees: 112...120 Testina: 1st rack travel in: 12.20 rom : 1360...1370 Speed 2nd rack travel in: 4.00 rpm : 1500...1530 Speed 4th rack travel in: 1650 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 67...75 Testing: : 100 Speed rom Minimum rack trave: 10.00 Speed rpm : 350
Rack travel in mm : 7.10...7.30
Rack travel in mm : 2.00 : 680...740 Speed rom CONSTANT REGULATION rbm : 370...440 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 900 Pressure : 13.20...13.30 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.50...10.70 2nd pressure hPa : 353 Rack travel in m: 11.20...11.30 3rd pressure hPa : 473 Rack travel in m: 12.40...12.80

1st version Aneroid pressure h: 900 Speed rpm: 800 Del.quantity cm3/: 87.0...91.0 1000 s: (85.0...93.0) Aneroid pressure h: rpm\_ : 500 Speed Del.quantity cm3/: 55.0...57.0 1000 s: (53.0...59.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.20 rpm : 1360...1370 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 145.0...165.0 1000 s: (140.0...170.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 7.10...7.30 Del.quantity cm3/: 20.0...24.0 1000 s: (17.5...26.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks: Set shutoff stop 1.5...2.0 mm before shutoff.

Speed

START CUT-OUT

1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS

Note remarks

: MB 6,0 g : 15.08.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 9 400 085 305 Combination no.

Injection pump

: PES6A95D410RS2772 Pump designation : 9 400 084 018 EP type number

Governor

: RQV300...1300AB1066-Governor design.

: 9 420 080 265 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: OM 366 A Engine

: 125.0 : 2600 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 1 417 413 006

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - . . : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.40...10.50

Del.guantity cm3/: 8.7...8.9

100 s: (8.5...9.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.9...7.1

Del.quantity cm3/: 1.2...1.8

100 s: (1.0...2.0)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

0.80...1.30 travel mm

: 500 2nd speed rpm

: 2.30...2.80 travel mm

: 750 3rd speed rpm

: 4.10...4.30 travel mm : 1500 4th speed

rpm : 8.50...8.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1500 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm : 1300Aneroid pressure h: 700

Del.quantity

: 87.5...89.5 1000 : (85.5...91.5)

cm3 : 3.50

1000 : (6.00)

RATED SPEED 1st version Control Lever position degrees: 55...63 Testing: 1st rack travel in: 9.40 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1460...1490 Speed 4th rack travel in: 1630 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 12...20 Testing: Speed : 100 rpm Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 6.90...7.10 CONSTANT REGULATION rpm : 420...550 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 10.40...10.50 od speed ppm : 700 2nd speed Rack travel in m: 10.90...11.00 4th speed rpm : 1000 Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 700 Pressure : 10.90...11.00 Rack travel mm Measurement Speed  $1/\min : 500$ 1st pressure hPa : - Rack travel in m: 9.50...9.70 2nd pressure hPa : 460

Rack travel in m: 10.70...10.80

Rack travel in m: 9.80...10.00

3rd pressure hPa : 250

START CUT-OUT

1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 700 Speed rpm Del.quantity cm3/: 86.5...89.5 1000 s: (84.0...92.0) Aneroid pressure h: 700 Speed : 1000 rpm Del.quantity cm3/: 90.0...93.0 1000 s: (87.5...95.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 60.5...62.5 1000 s: (58.5...64.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.40 rpm : 1340...1350 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 100.0...110.0 Rack travel in mm: 13.90...14.10 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : MB 4,0 f : 15.08.89 Edition Replaces

Test oil : ISO-4113

Combination no. : 9 400 085 307

Injection pump

Pump designation : PES4A95D410RS2774 : 9 400 084 019 EP type number

Governor

: RQV300...1300AB1228-Governor design.

: 9 420 080 268 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: OM 364 A Engine

1st version kW : 85.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 006

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 38...42

: 3.20...3.30 Prestroke mm

: (3.15...3,45)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 10.60...10.70

Del.quantity cm3/: 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 1.2...1.8

100 s: (1.0...2.0)

cm3 : 0.3 100 s: (0.5) Spread

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 0.80...1.30 travel mm rpm : 500 2nd speed

: 2.30...2.80 travel mm

rpm : 750 3rd speed

: 4.10...4.30 travel mm

: 1500 4th speed rpm : 8.50...8.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1500 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1300 Aneroid pressure h: 700

: 90.0...92.0 Del.quantity

1000 : (88.0...94.0)

Spread cm3 : 3.50 1000 : (6.00)

RATED SPEED 1st version Control lever position degrees: 56...64 Testing: 1st rack travel in: 9.60 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1470...1500 Speed 4th rack travel in: 1640 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 12...20 Testing: Speed : 100 rpm Minimum rack trave: 8.00 : 300 Speed rpm Rack travel in mm : 6.90...7.10 CONSTANT REGULATION rpm : 420...550 Speed TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 10.60...10.70 2nd speed rpm : 700 Rack travel in m: 11.20...11.30 4th speed rpm : 1000 Rack travel in m: 10.80...11.00 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 700 Speed rpm Pressure : 11.20...11.30 Rack travel mm Measurement 1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 9.90...10.10 2nd pressure hPa : 460 Rack travel in m: 11.00...11.10
3rd pressure hPa : 370
Rack travel in m: 10.30...10.50 START CUT-OUT E20

FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm : 700 Del.quantity cm3/: 92.0...95.0 1000 s: (89.5...97.5) Aneroid pressure h: 700 beed : 1000 rpm Del.quantity cm3/: 90.5...93.5 1000 s: (88.0...96.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 67.0...69.0 1000 s: (65.0...71.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.60 rpm : 1340...1350 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 100.0...110.0 Rack travel in mm: 13.90...14.10 Remarks:

1/min : 220 (240)

Speed

Note remarks

: MB 6,0 g 1 Test sheet Edition : 15.08.89

Replaces

: ISO-4113 Test oil

: 9 400 085 308 Combination no.

Injection pump

Pump designation : PES6A95D410RS2772 EP type number : 9 400 084 018

Governor

: RQV300...1400AB1065-Governor design.

18L

: 9 420 080 278 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM 366 Engine

: 100.0 1st version kW : 2800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 1 417 413 006

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina .

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1400

Rack travel in mm : 9.40...9.50

Del.guantity cm3/: 6.8...7.0

100 s: (6.6...7.2)

Spread cm3 : 0.3

100 s: (0.3)

2nd speed rpm : 300.0 Rack travel in mm : 7.1...7.3 Del.quantity cm3/: 0.9...1.5

100 s: (0.7...1.7)

cm3 : 0.3Spread 100 s: (0.3)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 0.80...1.30 travel mm

rom : 500 2nd speed travel mm : 2.30...2.80

3rd speed rpm : 750 travel mm

: 4.10...4.30 rpm : 1500 4th speed

: 8.50...8.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1500

Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1400 Speed

: 68.0...70.0 Del.quantity

1000 : (66.0...72.0)

: 3.50 Spread cm3

RATED SPEED

1st version Control Lever

position degrees: 55...63

Testing:

1st rack travel in: 8.40

rpm : 1440...1450 Speed

2nd rack travel in: 4.00

Speed rpm : 1520...1550 4th rack travel in: 1660

Speed rom : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 12...20

Testing:

Speed : 100 riom . Minimum rack trave: 8.50

Speed rpm : 300 Rack travel in mm : 7.10...7.30

CONSTANT REGULATION

rpm : 450...480 Speed

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/: 53.5...56.5 1000 s: (51.0...59.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.40

rpm : 1440...1450 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...110.0

Rack travel in mm : 13.70...13.90

Remarks:

Note remarks

Test sheet : MB 6,0 a 2 : 15.08.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 9 400 085 310

Injection pump

Pump designation : PES6A95D410RS2772 EP type number : 9 400 084 018

Governor

Governor design. : RQV300...1300AB1066-

: 9 420 080 279 Governer no.

Customer—spec. information

: DAIMLER-BENZ Customer

: OM 366 LA Engine

: 155.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 1 417 413 006

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 9.5...9.7

100 s: (9.3...9.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 1.2...1.8

100 s: (1.0...2.0)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed travel mm : 0.80...1.30

rpm : 500 2nd speed travel mm

: 2.30...2.80 rpm : 750 3rd speed

: 4.10...4.30 travel mm

rpm : 1500 4th speed

: 8.50...8.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1500 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 700

: 95.0...97.0 Del.quantity

1000 : (93.0...99.0)

: 3.50 Spread cm3

1000 : (6.00) RATED SPEED

1st version

Control Lever

position degrees: 55...63

Testing:

1st rack travel in: 10.10

Speed rpm: 1340...1350 2nd rack travel in: 4.00

rpm : 1470...1500 Speed

4th rack travel in: 1640

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 12...20

Testing:

rpm : 100 Speed Minimum rack trave: 8.00

: 300 rpm

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

rpm : 420...550 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 500 hPa : 700 Speed rpm Pressure

Rack travel mm : 11.10...11.20

Measurement

1/min: 500 Speed

1st pressure hPa : Rack travel in m: 9.40...9.70

2nd pressure hPa : 450

Rack travel in m: 10.80...10.90

3rd pressure hPa : 250

Rack travel in m: 9.90...10.10

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 : 700 riom

Del.quantity cm3/: 90.0...93.0 1000 s: (87.5...95.5)

Aneroid pressure h: -

rpm\_ : 500 Speed

Del.quantity cm3/: 60.5...62.5 1000 s: (58.5...64.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...110.0

Rack travel in mm : 13.90...14.10

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.80...2.90 Prestroke mm : (2.75...2.95) Note remarks Rack travel in mm : 10.50 : 1-5- 3- 6- 2- 4 Test sheet : CUM 8,3 b 3 Firing order : 28.09.89 : 30.9.88 Edition Replaces : ISO-4113 Test oil Phasing : 0-60-120-180-240-300 : 9 400 230 107 Combination no. Tolerance  $+ - \dots : 0.50 (0.75)$ Injection pump Pump designation : PES6A100D320/3RS2691 Time to cyl. no. : 1 EP type number : 9 410 230 028 BASIC SETTING Governor Governor design. : RQV350...1200AB1233R Governer no. : 9 420 231 018 1st speed rpm : 1200 Rack travel in mm : 10.80...10.90 Customer spec. information Del.quantity cm3/: 11.3...11.5 Customer : C.D.C 100 s: (11.1...11.7) : 6CT830 Engine cm3 : 0.3: 157.0 Spread 1st version kW Rated speed : 2400 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0 Rack travel in mm : 4.6...4.8 Del.quantity cm3/: 1.6...2.0 Test oil inlet temp. \_, C : 38...42 100 s: (1.3...2.2) Overflow valve cm3 : 0.3Spread : 1 417 413 047 100 s: (0.5) (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 017 GUIDE SLEEVE TRAVEL assembly rpm : 250 1st speed : 0.00...0.20 Opening . travel mm pressure, bar : 207...210 2nd speed rpm : 350 : 1.00...1.50 travel mm rpm : 450 Orifice plate 3rd speed : 1.90...2.40 : 0,6 travel mm diameter mm rpm : 1200 4th speed : 6.90...6.90 travel mm rpm : 1350: 9 681 271 029 Test lines 5th speed : 8.15...8.65 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X2.00X600 Control-lever position x Length mm Degree: -1 (A) Injection pump setting values

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 1435
Rack travel in mm : 6.70...9.30
FULL LOAD DELIV. AT FULL LOAD STOP
1st version
Speed rpm : 1200

Insp. values in parentheses Set equal delivery quant.

per values

Test pressure, bar: 27...29

BEGINNING OF DELIVERY

Aneroid pressure h: 700

: 113.0...115.0 Del.quantity 1000 : (111.0...117.0) cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 40...46

Testina:

1st rack travel in: 9.80

rpm : 1240...1250 Speed

2nd rack travel in: 4.00

Speed rpm : 1315...1345 4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 9...15 Speed rpm : 350

Speed

Rack travel in mm : 4.60...4.80

Rack travel in mm: 2.00

: 480...540 Speed rom

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm hPa : 240 Pressure

: 9.70...9.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.50 2nd pressure hPa : 333 Rack travel in m: 10.20...10.60

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 84.5...88.5 1000 s: (82.5...90.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.80

: 1240...1250 Speed rom

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 150.0...170.0

1000 s: (145.0...175.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 4.60...4.80

Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50

1000 s: (5.50)

Remarks:

Spread

: C.D.C. # 3908558

Start-of-delivery mark 11, cam angle after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

Note remarks

Test sheet : CUM 8,3 a 7 Edition : 20.12.88 : 30.9.88 Replaces Test oil : ISO-4113

: 9 400 230 110 Combination no.

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 030

Governor

: RSV450...1100A0C2190 Governor design.

-22R

: 9 420 234 173 Governer no.

Customer-spec. information Customer : C.D.C.

: 6CT830 Engine

: 150.6 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C . : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Openina .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Phasing

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 450.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 118.5...120.5 Del.quantity : (116.5...122.5) 1000

cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 42...50

Testina:

1st rack travel in: 11.10

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1195...1225 4th rack travel in: 1300 Speed

rom : 0.30...1.40Speed

LOW IDLE 1 Control Lever

position degrees: 22...30

Setting point w/out bumper spring

: 450 rpm Rack travel in mm: 5.3

Testing:

rpm : 100 Speed

Minimum rack trave: 19.00 : 450 Speed rpm

Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00

: 500...560 Speed rpm

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100
Rack travel in m: 12.10...12.20
2nd speed rpm : 750

Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed rpm

Del.quantity cm3/: 133.0...137.0

1000 s: (131.0...139.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.10

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm: 20.00...21.00

LOW IDLE

rpm : 450 Speed

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 16.0...20.0

1000 s: (13.5...22.5)

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

: C.D.C. # 3911542

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in

full-load delivery with torque-control

spring retainer.

Start-of-delivery mark 11, cam angle

after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

**E28** 

Note remarks

Test sheet

: CUM 8,3 a 8 : 20.12.88 : 30.9.88 Edition Replaces : ISO-4113 Test oil

Combination no. : 9 400 230 111

Injection pump

Pump designation : PES6A100D320/3RS2691

: 9 410 230 030 EP type number

Governor

: RSV450...1100A0C2190 Governor design.

-23R

: 9 420 234 174 Governer no.

Customer-spec. information : C.D.C. Customer

: 6CT830 Engine

: 134.2 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Phasing

Tolerance + - ., ... 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 450.0 2nd speed

Rack travel in mm: 5.7...5.9

Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2) cm3 : 0.3

Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 49...57

Testina:

1st rack travel in: 10.20

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1210...1240 Speed

3rd rack travel in: 4.00

: 1215...1245 Speed rpm

4th rack travel in: 1300

: 0.30...1.40 Speed rpm

LOW IDLE 1 Control Lever

position degrees: 31...39

Setting point w/out bumper spring

rpm : 450 Speed Rack travel in mm: 5.3

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

rpm : 450

Rack travel in mm : 5.70...5.90

Rack travel in mm : 2.00

: 535...595 Speed rom

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.20...11.30 2nd speed rpm : 750

Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/: 110.5...114.5 1000 s: (108.5...116.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

: 450 Speed rom

F02

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

: C.D.C. # 3911545

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark 11, cam angle after start of delivery cyl. 1

Limit shutoff stop screw to 1.0 mm.

Note inst. in remarks column

Test sheet : VMA 2,2 D : 09.11.89 Edition replaces : 03.12.86 Calibrating oil : ISO 4113

: VE 4/10F2100 L168-1 Injection pump

Type number : 0 460 404 042

Customer-specific information Customer : MOTORI

: HR 492 HJ Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. , C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery Prestroke mm : -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000 Charge press. hPa: 800 Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1000 Charge press. hPa: 800 Setting value bar: 3,1...3,7 Full-load del. with charge press.:

1/min: 1500 Charge press. hPa: 800 Del.quantity cm3/

1000H.: 60,5...61,5

cm3/:3,0Dispersion 1000H : -

Full-load del. w/out charge press.:

 $1/\min : 600$ Del.quantity cm3/

1000H.: 40,5...41,5

Low-idle speed regulation:

1/min: 400 Speed

Speed Del.quantity cm3/ 1000H: 13,0...17,0 Dispersion cm3/: 3,0

Full-load speed regulation:

Speed 1/min: 2300 Charge press. hPa: 800

Del.quantity cm3/

1000H: 27,0...33,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 37,0 mind

Load-dependent start of delivery:

1/min: 1500 Speed

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed Charge press. hPa: 800

mm: 1,8...2,2 mm: (1,3...2,7) TD travel

1/min: 1500 2nd speed

Charge press. hPa: 800

mm: 4,4...5,2 mm: (4,1...5,5) TD travel

1/min: 2100 3rd speed Charge press. hPa: 800 TD travel mm:  $7_26...8_24$ mm: (7,3...8,7)

Supply-pump pressure characteristic:

+	Del.quantity cm3/: 40,541,5 1000H: (38,543,5)
1st speed 1/min: 600	1000H: (38,543,5)
Charge press. hPa: 800	Zero delivery (stop):
Supply-pump har: 18 24	zero decivery (stop).
pressure bar: 1,82,4 2nd speed 1/min: 1000	
Charge press. hPa: 800	Electr. shutoff:
Supply-pump +	
pressure bar: 3,13,7 3rd speed 1/min: 2100	Speed 1/min: 400
3rd speed 1/min: 2100 +	ELAB volt: -
Charge press. hPa: 800	Del.quantity cm3/: 0,03,0 max. 1000H.: -
Supply-pump pressure bar: 6,77,5	max. 1000n.:
pressure bar. O/m/5	Idle delivery:
Overflow quantity at overflow valve:	
+	1st speed 1/min: 400
1st speed 1/min: 600 +	Del.quantity cm3/: 13,017, 1000H.: (10,020,0
Charge press. hPa: 800	1000H.: (10,020,0
Oveflow : 4183 + quantity cm3/10s: (2698)	2nd speed 1/min: 450
2nd speed 1/min: 2100	1000H : (0.510.5)
Charge press. hPa: 800	Del.quantity cm3/: 2,58,5 1000H.: (0,510,5) 3rd speed 1/min: 600
Overflow : 55138	Del.quantity cm3/: 0,02,0
quantity cm3/10s: (40153)	1000H.: -
Politican and broaders about	Automobie etention fuel delivers
Delivery-quant. and breakaway char.:	Automatic starting fuel delivery:
1st speed 1/min: 700	1st speed 1/min: 400
Charge-air pressure-setting	Del.quantity cm3/: -
point hPa: 400	Del.quantity cm3/: - ind. 1000H: 45,0
LDA stroke mm: 6,1	
Del.quantity cm3/: 52,053,0 1000H.: (50,055,0)	2nd speed 1/min: 500
2nd speed 1/min: 2450 +	Del.quantity cm3/: - max. 1000H : 55,0
Charge press. hPa: 800	iliax. 1000n . 33,0
Del.quantity cm3/: 1,09,0	Shutoff electromagnet:
1000H.: (0,59,5)	<b>33</b>
3rd speed 1/min: 2300 +	Cut-in
Charge press. hPa: 800	min. voltage : 10,0
Del.quantity cm3/: 27,033,0	Rated voltage : 12,0
1000H.: (26,034,0) 4th speed 1/min: 2100	Mounting and assembly dimensions:
Charge press. hPa: 800	Realiting and assembly afficiations
Del.quantity cm3/: 51,354,3	Designation
1000H.: (49,855,8) +	K mm : 3,23,4
5th speed 1/min: 1500	KF mm : 5,25,5
Charge press. hPa: 800	MS
Del.quantity cm3/: 60,561,5 1000H.: (59,063,0)	XK mm : 17,019,0 XL mm : 8,612,0
6th speed 1/min: 700	AL ((3)) . 0/0(2/0
Charge press. hPa: 800	Remarks:
Del.quantity cm3/: 52,053,0	
1000H.: (50,055,0)	
7th speed 1/min: 600	
Charge press. hPa: 800	
Del.quantity cm3/: 63,066,0 + 10000H.: (61,567,5)	
8th speed 1/min: 600	
Charge press. hPa: -	
The fire for a contract of the	

Note inst. in remarks column

Test sheet : VMA 2,2 F1 : 15.11.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/10F2100 L269-1 Injection pump

: 0 460 404 065 Type number

Customer-specific information : MOTORI VM Customer

Engine

: HR 492.4 HJ

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. \_, C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

bar: 147...150 pressure

Test ini. tubina : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1000 Speed Charge press. hPa: 1000 Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1000 Charge press. hPa: 1000 Setting value bar: 4,4...5,0 Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 1000

cm3/:3,0Dispersion 1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 700

Del.quantity cm3/ 1000H.: 45,0...46,0

Low-idle speed regulation:

1/min: 450

Del.quantity cm3/ 1000H.: 13,0...17,0

Full-load speed regulation:

1/min: 2300 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 27,0...33,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 45,0 mind

Load-dependent start of delivery:

Speed 1/min: 1500 Charge press. hPa: -

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed hPa: 1000 Charge press.

mm: 1,5...1,9 mm: (1,0...2,4) TD travel

1/min: 1500 2nd speed hPa: 1000 Charge press.

TD travel mm: 4,1...4,9 mm: (3,8...5,2)

3rd speed 1/min: 2100 Charge press. hPa: 1000

mm: 7,1...7,9 TD travel mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: Charge press. hPa: Supply-pump	1000	Zero delivery (stop):
pressure bar: 2nd speed 1/min:	3,23,8	Electr. shutoff:
Charge press. hPa:	4000	Speed 1/min: 450 ELAB volt: -
pressure bar: 3rd speed 1/min: Charge press. hPa:	4,45,0 2100 1000	Del.quantity cm3/: 0,03,0 max. 1000H.: -
Supply-pump pressure bar:	7.58.1	Idle delivery:
Overflow quantity as	t overflow valve:	1st speed 1/min: 450 Del.quantity cm3/: 13,017,0 1000H.: (10,020,0)
1st speed 1/min: Charge press. hPa:	1000 +	2nd speed 1/min: 475 Del.quantity cm3/: 7,013,0 1000H.: (5,015,0)
Oveflow : quantity cm3/10s: 2nd speed 1/min:	(2698) 2100	3rd speed 1/min: 550 Del.quantity cm3/: 0,55,5
Charge press. hPa: Overflow :	1000 + 55138 + 75138	TOUCH.: -
quantity cm3/10s:	(40155)	Automatic starting fuel delivery:
Delivery-quant. and 1st speed 1/min:	700	1st speed 1/min: 400 Del.quantity cm3/: - ind. 1000H: 50,0
Charge-air pressure point hPa:	setting +	2nd speed 1/min: 550
Del.quantity cm3/: 1000H.: 2nd speed 1/min:	58,559,5 (56,561,5)	Del.quantity cm3/: - max. 1000H : 60,0
Charge press. hPa: Del.quantity cm3/:	1000	Shutoff electromagnet:
3rd speed 1/min:	2300	Cut-in min. voltage : 10,0
Charge press. hPa: Del.quantity cm3/:	1000 + 27,033,0 +	Rated voltage : 12,0
4th speed 1/min:	2100 +	Mounting and assembly dimensions:
Charge press. hPa: Del.quantity cm3/: 1000H.:	57,558,5	Designation K mm : 3,23,4 KF mm : 5,66,0
5th speed 1/min:	1500	KF mm : 5,66,0 MS mm : 0,61,0 XK mm : 20,022,0
Del.quantity cm3/:		XL mm : 10,013,4
6th speed 1/min: Charge press. hPa:	450 +	Remarks:
Del.quantity cm3/: 1000H.: 7th speed 1/min:	(56,561,5)	
Charge press. hPa: Del.quantity cm3/:	1000 +	
8th speed 1/min: Charge press. hPa:	(66,272,2)	
Del.quantity cm3/:		

Note inst. in remarks column

: VMA 2,2 M : 07.11.89 Test sheet Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/10F1600 L379

: 0 460 404 067 Type number

Customer-specific information

Customer : VM

: HR 494 HT Engine

k: 68 Power

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ... C

with thermometer: 40...48 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

bar: 147...150 pressure

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2

mm: 840 x Length

Start of delivery Prestroke mm : -

(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1200 Speed Charge press. hPa: 1000 Setting value mm: 2,1...2,5

Supply-pump pressure:

1/min: 1200 Speed Charge press. hPa: 1000 Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1200 Charge press. hPa: 1000

Charge press. In a. Del.quantity cm3/
1000H.: 61,0...62,0
Dispersion cm3/: 3,5 1000H : (4,0)

Full-load del. w/out charge press.:

1/min: 600 Speed

Del.quantity cm3/

1000H.: 52,0...53,0

Low-idle speed regulation:

Speed 1/min: 400 Charge press. hPa: -

Del.quantity cm3/ 1000H.: 11,0...15,0 Dispersion cm3/: 3,5 1000H.:

Full-load speed regulation:

Speed 1/min: 1700 Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 32,0...38,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 60,0 mind

Load-dependent scart of delivery:

1/min: 1200 Speed Charge press, hPa: 1000

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed Charge press. hPa: 1000

mm: 1,0...1,8 mm: (0,7...2,1) 1/min: 1200 TD travel

2nd speed

Charge press. hPa: 1000 TD travel mm: 2,1...2,5 mm: (1,6...3,0)

3rd speed 1/min: 1600

Charge press. hPa: 1000

TD travel mm: 3,94	+27 +	Del.quantity_cm3/: 61,062,0
mm: (3,6	.5,0)	1000H.: (55,561,5) 8th speed 1/min: 600
Supply-pump pressure charac	cteristic:	Charge press. hPa: -
1st speed 1/min: 750	‡	Del.quantity cm3/: 52,053,0 1000H: (49,555,5)
Charge press. hPa: 1000	†	Zero delivery (stop):
Supply-pump pressure bar: 3,03	3,6 I	• ,
2nd speed 1/min: 1200	+	Mech. shutoff:
Charge press. hPa: 1000 Supply-pump	Ī	Speed 1/min: 1600
pressure bar: 4,85 3rd speed 1/min: 1600	5,4	Del.quantity cm3/: 03 1000H.: -
Charge press. hPa: 1000	Ī	1000н
Supply-pump	,, +	Electr. shutoff:
pressure bar: 6,47	' <sup>''</sup>	Speed 1/min: 400
Overflow quantity at overfl	low valve:	ELAB volt: -
1st speed 1/min: 750	‡	Del.quantity cm3/: 0,03,0 max. 1000H.: -
Charge press. hPa: 1000	_ +	
Oveflow : 4183 quantity cm3/10s: (269	787	Idle delivery:
2nd speed 1/min: 1600	· · · · · · · · · · · · · · · · · · ·	1st speed 1/min: 400
Charge press. hPa: 1000 Overflow : 5513	38 1	Del.quantity cm3/: 11,015,0 1000H.: (8,518,5)
quantity cm3/10s: (401	153)	2nd speed 1/min: 480
Delivery-quant. and breakaw	38 153) Way char.:	Del.quantity cm3/: 2,08,0 1000H.: (1,09,0)
•	tay criat	3rd speed 1/min: 550
1st speed 1/min: 750 Charge-air pressure-setting	· İ	Del.quantity cm3/: D,03,0 1000H.: -
point hPa: 200	1	
LDA stroke mm: -	50 n	Automatic starting fuel delivery:
Del.quantity cm3/: 58,0 1000H.: (55,5	61,5)	1st speed 1/min: 250
2nd speed 1/min: 1730	†	Del.quantity cm3/: - ind. 1000H: 58,0
Charge press. hPa: 1000 Del.quantity cm3/: 0,03	3,0 I	
1000H.: -	†	2nd speed 1/min: 450 Del.quantity cm3/: -
3rd speed 1/min: 1700 Charge press. hPa: 1000	Į	max. 1000H: 66,0
Del.quantity cm3/: 32,0	.38,0	Shutoff electromagnet:
1000H.: (29,0 4th speed 1/min: 1600	T	Shator ecectionagnet.
Charge press. hPa: 1000	F. F	Cut-in min. voltage : 10,0
Del.quantity cm3/: 53,5 1000H.: (52,0	.58,0)	Rated voltage : 12,0
5th speed 1/min: 1200	†	Mounting and accombly dimensions:
Charge press. hPa: 1000 Del.quantity cm3/: 61,0	.62,0	Mounting and assembly dimensions:
1000H.: (58,5	64,5)	Designation mm · 32 3/
6th speed 1/min: 750 Charge press. hPa: 1000	Į	K mm : 3,23,4 KF mm : 5,66,0
Del.quantity cm3/: 60,0		MS mm : 0,61,0
1000H.: (58,5 7th speed 1/min: 750	.04,0)	Remarks:
Charge press. hPa: 200	+	-

Note inst. in remarks column

: ONA 3,4 A : 03.11.89 Test sheet Edition : 22.04.88 replaces : ISO 4113 Calibrating oil

Injection pump : VE 6/10F1800 R209 : 0 460 406 048

Type number

Customer-specific information : ONAN Customer

Engine : L634T

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. , C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke

te mm: 0,2 (from BDC): +0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1400 Speed Charge press. hPa: 800 mm: 3,9...4,3 Setting value

Supply-pump pressure:

1/min: 1400 Speed Charge press. hPa: 800 Setting value bar: 4,8...5,4 Full-load del. with charge press.:

1/min: 1400 Charge press. hPa: 800

Del.quantity cm3/ 1000H: 58,5...59,5 Dispersion cm3/: 3,0

1000H : (4,0)

Full-load del. w/out charge press.:

 $1/\min : 700$ Speed

Del.quantity cm3/ 1000H.: 44,0...45,0

Low-idle speed regulation:

Speed 1/min: 400

Del.quantity cm3/

1000H.: 14,0...18,0 cm3/: 3,0

Dispersion 1000H.: -

Full-load speed regulation:

1/min: 1900 Speed Charge press. hPa: 800

Del.quantity cm3/

1000H: 37,0...43,0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 42,0 mind

Load-dependent start of delivery:

1/min: 1400 Speed Charge press. hPa: 800

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed Charge press. hPa: 800

TD travel mm: 1,0...1,8 mm: (0,7...2,1)

1/min: 1400 2nd speed hPa: 800 Charge press.

mm: 3,9...4,3 mm: (3,4...4,8) TD travel

1/min: 1800 3rd speed Charge press. hPa: 800

mm: 5,4...6,2 mm: (5,1...6,5) TD travel

Supply-pump pressure characteristic:	İ	Del.quantity cm3/: 58,061,0 1000H: -
1 ot amount 1/mins 900	T	9th speed 1/min: 700
1st speed 1/min: 800	T	Change appear 1/11/11: 700
Charge press. hPa: 800	+	Charge press. hPa: 300
Supply-pump	+	Del.quantity cm3/: 50,551,5
pressure bar: 2,73,3	+	1000H: (48,753,3)
2nd speed 1/min: 1400	+	10th speed 1/min: 700
Charge press. hPa: 800	+	Charge press. hPa: -
Supply-pump	1	Del.quantity cm3/: 44,045,0
programs have 60 5 6		1000H: (42,246,8)
pressure bar: 4,85,4 3rd speed 1/min: 1800	T	1000n: (42,240,0)
3rd speed 1/min: 1800	+	
Supply-pump	+	Zero delivery (stop):
pressure bar: 6,06,6	+	
	+	Mech. shutoff:
Overflow quantity at overflow valve:	1	
over reon quarterey at over reon vacte.	L	Speed 1/min: 1800
Automorphism 700	T	7 1/11/11 1000
1st speed 1/min: 700	†	Del.quantity_cm3/: 03
Charge press. hPa: 800	+	1000H.: -
Oveflow : 4183	+	
quantity cm3/10s: (2698)	+	Electr. shutoff:
2nd speed 1/min: 1800	1	
Change appear has 800	1	Speed 1/min: 350
Charge press. hPa: 800	T	
Overflow : 55138	+	ELAB volt: -
quantity cm3/10s: (40153)	+	Del.quantity cm3/: 0,03,0
·	+	max. 1000H.: -
Delivery-quant. and breakaway char.:	+	
bootively apparent and animality offering	1	Idle delivery:
1st speed 1/min: 700	1	zace ageivery.
	T	1st speed 1/min. /00
Charge-air pressure-setting	+	1st speed 1/min: 400
point hPa: 300	+	Del.quantity cm3/: 14,018,0
LDA stroke mm: 5,1	+	Del.quantity cm3/: 14,018,0 1000H.: (12,020,0)
Del.quantity cm3/: 44,045,0	+	2nd speed 1/min: 450
1000H.: (42,246,8)	1	Del.quantity cm3/: 0,06,0
2nd speed 1/min: 2050	1	1000H.: -
Change and the 200	Ŧ	7nd anged 4/min 350
Charge press. hPa: 800	T	3rd speed 1/min: 350
Del duantity cms/   133   5.11		
be c. quarte tey chor. a joi. 1.5/6	+	Del.quantity cm3/: 26,533,5
Del.quantity cm3/: 0,03,0 1000H.: -	‡	Deliquantity cm3/: 26,533,5 1000H.: (26,034,0)
1000H.: -	†	1000H.: (26,034,0)
1000H.: - 3rd speed 1/min: 2000	†	1000H.: (26,034,0)
3rd speed 1/min: 2000 Charge press, hPa: 800	+++++++++++++++++++++++++++++++++++++++	1000H.: (26,034,0)  Automatic starting fuel delivery:
3rd speed 1/min: 2000 Charge press, hPa: 800	+++++++++++++++++++++++++++++++++++++++	1000H.: (26,034,0)  Automatic starting fuel delivery:
3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5	+ + + + + + + + + + + + + + + + + + + +	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed 1/min: 220
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: - 4th speed 1/min: 1950	+ + + + + + + + + + + + + + + + + + + +	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed  1/min: 220  Del.quantity cm3/: -
T000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800	+++++++++++++++++++++++++++++++++++++++	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed 1/min: 220
T000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800	+++++++++++++++++++++++++++++++++++++++	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed    1/min: 220  Del.quantity cm3/: - ind.    1000H: 42,0
TOOOH.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0	+++++++++++++++++++++++++++++++++++++++	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed   1/min: 220  Del.quantity cm3/: - ind.   1000H: 42,0
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0)	<del></del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900	<del>┤╌╏╌╏╌╏╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800	<del>┤╌╏╌╏╌╏╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0)	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Charge press. hPa: 800	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5	<del>┤╌╏╌╏╌╏╌╏╌╏╌╏╌╏╌╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
T000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3)	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
1000H.: -  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: -  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400	<del>┤╴╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	Automatic starting fuel delivery:  1st speed
TOUCH.: —  3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: —  4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0)  5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400 Charge press. hPa: 800 Charge press. hPa: 800	<del>╶╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	1000H.: (26,034,0)  Automatic starting fuel delivery:  1st speed
3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: - 4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/: 58,559,5	<del>╶╏╶╏╶╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈╏┈</del>	Automatic starting fuel delivery:  1st speed
3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: - 4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/: 58,559,5	<del>╺╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	Automatic starting fuel delivery:  1st speed
3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: - 4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/: 58,559,5 1000H.: (56,761,3)	<del>┤╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏</del>	Automatic starting fuel delivery:  1st speed
3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: - 4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/: 58,559,5 1000H.: (56,761,3) 8th speed 1/min: 700	<del>╎╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏</del>	Automatic starting fuel delivery:  1st speed
3rd speed 1/min: 2000 Charge press. hPa: 800 Del.quantity cm3/: 5,514,5 1000H.: - 4th speed 1/min: 1950 Charge press. hPa: 800 Del.quantity cm3/: 23,031,0 1000H.: (22,032,0) 5th speed 1/min: 1900 Charge press. hPa: 800 Del.quantity cm3/: 37,043,0 1000H.: (36,044,0) 6th speed 1/min: 1800 Charge press. hPa: 800 Del.quantity cm3/: 51,554,5 1000H.: (50,755,3) 7th speed 1/min: 1400 Charge press. hPa: 800 Del.quantity cm3/: 58,559,5 1000H.: (56,761,3)	<del>┤╌╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	Automatic starting fuel delivery:  1st speed

SVS max. XK XL mm : 1,7 mm : 20,0...22,0 mm : 10,1...13,5

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: ONA 3,4C : 03.11.89 Test sheet Edition : 13.07.88 replaces Calibrating oil : ISO 4113

: VE 6/10F 1500R 209-2 Injection pump

: 0 460 406 060 Type number

Customer Part-No. :

Customer-specific information

Customer

: ONAN

Engine

: L634TA HD

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ., C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Openina

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm: 0,2 Prestroke

(from BDC): +-0.02(0.04)

Indicator setting: Piston stroke mm: 1.0 Outlet. : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1400 Speed Charge press. hPa: 800

Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1400 Charge press. hPa: 800 Setting value bar: 4,8...5,4

Full-load del. with charge press.:

1/min: 1100 Speed Charge press. hPa: 800

Del.quantity cm3/ 1000H: 55,5...56,5 Dispersion cm3/: 3,0 1000H: (3,0)

Full-load del. w/out charge press.:

1/min : 700 Speed

Del.quantity cm3/ 1000H.: 42,5...43,5

Low-idle speed regulation:

Speed 1/min: 400

Del.quantity cm3/ 1000H.: 14,0...18,0 Dispersion cm3/: 3,0

1000H.: (3,0)

Full-load speed regulation:

1/min: 1640 Speed Charge press. hPa: 800

Del.quantity cm3/

1000H: 20,0...24,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 42,0

Load-dependent start of delivery:

1/min: 1100 Speed Charge press. hPa: 800

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800 Charge press. hPa: 800

TD travel mm: 1,4...2,2 mm: (1,1...2,5) 2nd speed 1/min: 1100

Charge press. hPa: 800

TD travel mm: 2,73,3	- Del.	quantity 10	cm3/:	55,5.	56,5
TD travel mm: 2,73,3 mm: (2,33,7)  3rd speed 1/min: 1400	- 7th	speed 1	/min:	700	58,5)
Charge press. hPa: 800	- Char	ge press.	hPa:	SUU_	50 E
TD travel mm: 4,34,7 mm: (3,85,2)	- Det.	quantity 10	100H ·	- (C)	30,5
Supply-pump pressure characteristic:	- 8th	speed 1 ge press.	/min:	700	
	- Del.	quantity	cm3/:	48,0.	49,0
1st speed 1/min: 700	- O+h	speed 1	/min:	700	50,8)
Charge press. hPa: 800 - Supply-pump		ge press.			
pressure bar: 2,32,9	- Del.	quantity	cm3/:	42,5.	43,5
pressure bar: 2,32,9 2nd speed 1/min: 1100	-	1	000H:	(40,7.	45,3)
Charge press. hPa: 800	- 7	مام المراجعة	(atam)		
Supply-pump	- Zero -	delivery	(Stop)	•	
pressure bar: 3,84,4 - 3rd speed 1/min: 1400 -	- - Mech	. shutoff:			
Charge press. hPa: 800	-				
Supply-pump -	- Spee	d 1	/min:	1500	
pressure bar: 4,85,4	- Del. -	quantity 10	cm3/:	03	
Overflow quantity at overflow valve:	- - Elec	tr. shutof	f:		
1st speed 1/min: 700		اء اد	/	750	
Charge press. hPa: 800 Oveflow : 4183	- Spee - ELAB		/min: volt:		
quantity cm3/10s: (2698)	- ELAD	quantity	cm3/:	0.0	3,0
2nd speed 1/min: 1500	- max.	10	ЮОН.:		~,~
Charge press. hPa: 800	•				
Overflow : 55138 -	- Idle	delivery:			
quantity cm3/10s: (40153)	10+	opened 1	/min.	<b>/.</b> 00	
Delivery-quant. and breakaway char.:	- Del.	speed 1 quantity 10	cm3/:	14.0.	.18,0 .20,0)
1st speed 1/min: 700	- 2nd	speed 1	/min:	450	
Charge air pressure setting -	- <u>D</u> el.	quantity speed 1	cm3/:	0,0	6,0
point hPa: 350	- 3rd	speed 1	/min:	35U	77 5
LDA stroke mm: 6,5 Del.quantity cm3/: 48,048,5	- pet.	quantity 10	CIID/:	20,5. <i>.</i>	33,3
1000H.: (46,250,8)	<b>-</b>	10			
2nd speed	- Auto	matic star	ting f	uel de	livery:
Charge press. hPa: 800		, ,	, .	220	
Del.quantity cm3/: 0,06,0 -			/min:		
1000H.:	- ind	quantity 1	000H:	42.0	
Charge press. hPa: 800	- 1110	•	OCO!!!	42/0	
Del.quantity cm3/: 20,024,0 -	- 2nd :	speed 1	/min:	300	
1000H.: (18,026,0) -		quantity			
4th speed 1/min: 1580	- max.	10	: HOO	42,0	
Charge press. hPa: 800 - Del.quantity cm3/: 43,051,0 -	- Shutt	off electr	വനമനാല	t:	
1000H.: -	•	OTT CECULT	Silagi ic		
5th speed 1/min: 1500 -	- Cut-				
Charge press. hPa: 800	- min	. voltage		10,0	
Del.quantity cm3/: 52,555,5 - 1000H.: (51,756,3) -	-	d voltage		12,0	
6th speed	- Moun	ting and a	ssembl	y dime	ensions:
enion de la page 10 au en en en	- Desi	gnation			

K mm : KF mm : 5,6...6,0
MS mm : 0,6...1,0
SVS max. mm : 2,1

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: VOL 3,1 A1 : 03.11.89 Test sheet Edition : 04.12.86 replaces : ISO 4113 Calibrating oil

Injection pump : VE 4/11F1625 L217-2

: 10 460 414 031 Type number

Customer-specific information : VOLVO PENA Customer

: TAM 31 **Engine** 

k: 81 Power

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ., C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening.

bar: 130...133 pressure

Test ini. tubina : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

Prestroke

e mm: 0,3 (from BDC): +0,02(0,04)

Injection pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1500 Speed Charge press. hPa: 1000 mm: 4,3...4,7 Setting value

Supply-pump pressure:

1/min: 1500 Speed Charge press. hPa: 1000 Setting value bar: 6,1...6,7

Full-load del. with charge press.:

1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 83,5...84,5

cm3/:5,0Dispersion 1000H : -

Full-load del. w/out charge press.:

 $1/\min : 650$ 

Del.quantity cm3/

1000H.: 51,0...52,0

Low-idle speed regulation:

Speed 1/min: 350

Del.quantity cm3/

1000H.: 23,0...27,0 cm3/: 3,5 Dispersion

1000H.: -

Full-load speed regulation:

1/min: 1800 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 31,0...37,0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 95,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100

hPa: 1000 Charge press. mm: 0,9...1,7 mm: (0,6...2,0) TD travel

2nd speed 1/min: 1500 Charge press. hPa: 1000

mm: 4,3...4,7 mm: (3,8...5,2) TD travel

1/min: 1625 3rd speed

Charge press. hPa: 1000 TD travel mm: 5,0...5,8

mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 800

Charge press. hPa: 1000 Supply-pump pressure bar: 3,44,0 2nd speed 1/min: 1500 Charge press. hPa: 1000 Supply-pump pressure bar: 6,16,7 3rd speed 1/min: 1625 Charge press. hPa: 1000 Supply-pump pressure bar: 6,67,2 Overflow quantity at overflow valve:	Charge press. hPa: 1000 Del.quantity cm3/: 90,093,0 1000H: (88,594,5) 10th speed 1/min: 800 Charge press. hPa: 300 Del.quantity cm3/: 65,066,0 1000H: (63,267,8) 11th speed 1/min: 650 Charge press. hPa: - Del.quantity cm3/: 51,052,0 1000H: (49,253,8)  Zero delivery (stop):
of or reason quarterly at of or reconstruction	+
1st speed 1/min: 800 Charge press. hPa: 1000 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1625 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char::  1st speed 1/min: 800 Charge-air pressure-setting point hPa: 300 LDA stroke mm: 6,4	Electr. shutoff:  Speed 1/min: 350 ELAB volt: 12,0 Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 350 Del.quantity cm3/: 23,027,0 1000H.: (20,030,0) 2nd speed 1/min: 400 Del.quantity cm3/: 7,013,0 1000H.: (5,514,5)
Del.quantity cm3/: 65,066,0 1000H.: (63,267,8) 2nd speed 1/min: 1970 Charge press. hPa: 1000	3rd speed 1/min: 460  Del.quantity cm3/: 0,03,0 1000H.: -
Del.quantity cm3/: 0,03,0 1000H.: -	Shutoff electromagnet:
3rd speed	Cut-in min. voltage : 10,0 Rated voltage : 12,0
4th speed 1/min: 1750 Charge press. hPa: 1000	Mounting and assembly dimensions:
Del.quantity cm3/: 53,061,0	+
1000H.: - 5th speed 1/min: 1800 Charge press. hPa: 1000 Del.quantity cm3/: 31,037,0 1000H.: (30,038,0) 6th speed 1/min: 1625 Charge press. hPa: 1000 Del.quantity cm3/: 78,581,5 1000H.: (77,083,0) 7th speed 1/min: 1500 Charge press. hPa: 1000 Del.quantity cm3/: 83,584,5 1000H.: (81,786,3) 8th speed 1/min: 1000 Charge press. hPa: 1000 Del.quantity cm3/: 91,794,3	Designation  K mm:—  KF mm: K-OT  MS mm: 1,21,45  SVS max. mm: 1,2  XK mm: 18,820,8  XL mm: 11,114,5  Remarks:  Operate control lever after each manifold—pressure compensator pressure change.  * Correction at adjusting nut (46)
1000H: (90,795,3) 9th speed 1/min: 800	‡

Note inst. in remarks column

: VOL 3,1 A2 : 03.11.89 Test sheet Edition : 04.12.86 replaces : ISO 4113 Calibrating oil

: VE 4/11F1625 L217-4 Injection pump

: 0 460 414 034 Type number

Customer-specific information : VOLVO PENTA Customer

: TAM 31 Engine

k: 81 Power

TEST BENCH REQUIREMENTS

Calibrating oil return temp. , C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening

pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

mm : 0,3Prestroke

(from BDC): +0.02(0.04)

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Speed Charge press. hPa: 1000 Setting value mm: 4,3...4,7

Supply-pump pressure:

1/min: 1500 Speed Charge press. hPa: 1000 Setting value bar: 6,1...6,7

Full-load del. with charge press.:

1/min: 1500 Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 83,5...84,5

cm3/:5,0Dispersion 1000H : -

Full-load del. w/out charge press.:

 $1/\min : 650$ 

Del.quantity cm3/

1000H.: 51,0...52,0

Low-idle speed regulation:

1/min: 350 Speed

Del.quantity cm3/

1000H.: 23,0...27,0 cm3/: 3,5

Dispersion 1000H.: -

Full-load speed regulation:

Speed 1/min: 1800 Charge press. hPa: 1000

Del.quantity cm3/

1000H: 31,0...37,0

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 95,0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1100 1st speed hPa: 1000 Charge press.

mm: 0,9...1,7 TD travel mm: (0,6...2,0)

2nd speed 1/min: 1500 Charge press. hPa: 1000

TD travel mm: 4,3...4,7 mm: (3,8...5,2)

3rd speed 1/min: 1625 Charge press. hPa: 1000

mm: 5,0...5,8 TD travel mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 800

Charge press. hPa: 1000 Supply-pump pressure bar: 3,44,0 2nd speed 1/min: 1500 Charge press. hPa: 1000 Supply-pump pressure bar: 6,16,7 3rd speed 1/min: 1625 Charge press. hPa: 1000 Supply-pump pressure bar: 6,67,2	Charge press. hPa: 1000 Del.quantity cm3/: 90,093,0 1000H: (88,594,5) 10th speed 1/min: 800 Charge press. hPa: 300 Del.quantity cm3/: 65,066,0 1000H: (63,267,8) 11th speed 1/min: 650 Charge press. hPa: - Del.quantity cm3/: 51,052,0 1000H: (49,253,8)
Overflow quantity at overflow valve:	Zero delivery (stop):
1st speed 1/min: 800 Charge press. hPa: 1000 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1625 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)	Electr. shutoff:  Speed 1/min: 350 ELAB volt: 24,0 Del.quantity cm3/: 0,03,0 max. 1000H.: -
Dalivant and hapakaway chan	† Idle delivery:
Delivery-quant. and breakaway char.:  1st speed 1/min: 800 Charge-air pressure-setting point hPa: 300 LDA stroke mm: 6,4 Del.quantity cm3/: 65,066,0 1000H.: (63,267,8) 2nd speed 1/min: 1970 Charge press. hPa: 1000	1st speed 1/min: 350 Del.quantity cm3/: 23,027,0 1000H.: (20,030,0) 2nd speed 1/min: 400 Del.quantity cm3/: 7,013,0 1000H.: (5,514,5) 3rd speed 1/min: 460 Del.quantity cm3/: 0,03,0 1000H.: -
Del.quantity cm3/: 0,03,0 1000H.: -	+ Shutoff electromagnet:
3rd speed	Cut-in min. voltage : 20,0 Rated voltage : 24,0
4th speed 1/min: 1750 Charge press. hPa: 1000 Del.quantity cm3/: 53,061,0	Mounting and assembly dimensions:
1000H.: -  5th speed 1/min: 1800 Charge press. hPa: 1000 Del.quantity cm3/: 31,037,0	Designation  K
Del.quantity cm3/: 83,584,5 1000H.: (81,786,3) 8th speed 1/min: 1000	manifold pressure compensator pressure change.
Charge press. hPa: 1000 Del.quantity cm3/: 91,794,3 1000H: (90,795,3)	* Correction at adjusting nut (46)
9th speed 1/min: 800	Pushing electromagnet.

Note inst. in remarks column

: SOF 2,5K2 Test sheet : 02.11.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/11F1900 R127-2 Injection pump

: 0 460 414 038 Type number

Customer-specific information : IVECO SOFIM Customer

: 8140.21.215 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. "C.

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 023 assembly

Opening

bar: 172...175 pressure

Perforated plate

mm: 0.4diameter

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +0.02(0.04)

Injection pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 4,6...5,0

Supply-pump pressure:

1/min: 1100 Speed

Charge press. hPa: 1000 Setting value bar: 5,1...5,7

Full-load del. with charge press.:

1/min: 1100 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 44,7...45,7 Dispersion cm3/: 3,5 1000H: -

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/

1000H.: 38,5...39,5

Low-idle speed regulation:

1/min: 400 Speed Charge press. hPa: -

Del.quantity cm3/ 1000H.: 13,0...17,0

Full-load speed regulation:

Speed 1/min: 2300 Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 15,0...21,0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity mind cm3/1000H.: 60,0

Load-dependent start of delivery:

1/min: 1100 Speed Charge press. hPa: -

Inspection-pump test specifications Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 800 Charge press. hPa: 1000

mm: 2,8...3,6 mm: (2,5...3,9) TD travel

1/min: 1100 2nd speed Charge press. hPa: 1000

mm: 4,6...5,0 mm: (4,1...5,5) 1/min: 1500 TD travel

3rd speed

Charge press. hPa: 1000

TD travel mm: 6,16,9	- Del.quantity cm3/: 42,344,7
mm: (5,87,2)	1000H.: (40,946,1)
4th speed 1/min: 1900	7th speed 1/min: 1100
Charge press. hPa: 1000	Charge press. hPa: 1000
TD travel mm: 7,68,4	Del. quantity cm3/: 44.745.7
mm: (7,38,7)	Del.quantity cm3/: 44,745,7 1000H.: (42,647,8)
mm (1/3.1.0/1/	8th speed 1/min: 900
Complete normal processor characteristics	
Supply-pump pressure characteristic:	Charge press. hPa: 400
4	Del.quantity cm3/: 37,538,5
1st speed 1/min: 500	1000H: (35,440,6)
Charge press. hPa: 1000	9th speed 1/min: 500
Supply-pump .	Charge press. hPa: 1000
pressure bar: 3,33,9	Del.quantity cm3/: 50,854,2
2nd speed 1/min: 1100	1000H: (49,155,9)
Charge press. hPa: 1000	10th speed 1/min: 500
Supply-pump .	Charge press. hPa: -
pressure bar: 5,15,7	Del.quantity cm3/: 38,539,5
3rd speed 1/min: 1900	1000H: (36,441,6)
Charge press. hPa: 1000	100011. (39)441,07
Cimpliano	Zero delivery (stop):
Supply-pump -	Zero decivery (stop).
pressure bar: 7,27,8	Ť
· · · · · · · · · · · · · · · · · · ·	Talla dalânam.
Overflow quantity at overflow valve:	Idle delivery:
	†
1st speed 1/min: 500	1st speed 1/min: 400
Charge press. hPa: -	Del.quantity cm3/: 13,017,0 1000H.: 10,519,5
Oveflow : 4183 -	1000H.: 10,519,5
quantity cm3/10s: (2698)	+ 2nd speed 1/min: 350
2nd speed 1/min: 1900	- Deliquantity cm3/: 27,033,0
Charge press. hPa: 1000	Del.quantity cm3/: 27,033,0 1000H.: (25,534,5)
Overflow : 55138	3rd speed 1/min: 550
quantity cm3/10s: (40153)	Del quantity cm3/: 0.0 5.0
quarterty oner root (45.1.1.155)	Del.quantity cm3/: 0,05,0 1000H.: -
Delivery-quant. and breakaway char.:	1005(1
betively qualit. and breakaway that	Automatic starting fuel delivery:
1st speed 1/min: 900	hatchiatte stateting thet decivery.
	T 1st speed 1/min. 200
Charge-air pressure-setting	1st speed 1/min: 200
point hPa: 400	Charge press. hPa: -
LDA stroke mm: 6,2	Del.quantity cm3/: -
Del.quantity cm3/: 37,538,5	ind. 1000H: 70,0
1UUUH.: (35,44U,6)	<del> </del>
2nd speed 1/min: 2450 -	2nd speed 1/min: 350
Charge press. hPa: 1000	Charge press. hPa: -
Del.quantity cm3/: 0,05,0 -	Del.quantity cm3/: -
1000H.: -	max. 1000H : 70,0
3rd speed 1/min: 2300	
Charge press. hPa: 1000	- Shutoff electromagnet:
Del.quantity cm3/: 15,021,0 -	
1000H.: (13,522,5)	Cut-in
4th speed 1/min: 2100 -	min. voltage : 10,0
	Rated voltage : 12,0
Charge press. hPa: 1000 Del.quantity cm3/: 30,038,0	nated voltage . 12,0
10004 . (20 E 79 E)	Mountains and assembly dimensions
1000H.: (29,538,5)	Mounting and assembly dimensions:
5th speed 1/min: 1900 -	<b>T</b>
Charge press. hPa: 1000	Designation
Del.quantity cm3/: 41,644,0	- K mm : -
1000H.: (40,245,4)	KF mm : K-OT
6th speed 1/min: 1500 -	MS mm : 0,81,2
Charge press. hPa: 1000	SVS max. mm : 1,5
were the second	L





Note inst. in remarks column

: FOR 2,5 B : 07.11.89 Test sheet Edition : 12.05.89 replaces Calibrating oil : ISO 4113

: VE 4/11F2000 R288 Injection pump : 0 460 414 051 Type number

Customer-specific information : FORD Customer

: 2.5 DI Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 023 assembly

**Opening** 

bar: 172...175 pressure

Perforated plate

mm : 0.4diameter

Test inj. tubing : 1 680 750 073

Outside diameter x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Start of delivery block Piston stroke

mm: 0,78 mm: 0,73...0,83

Outlet : B

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Setting value mm: 2,5...2,9 Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/

1000H.: 30,5...31,5

Low-idle speed regulation:

1/min: 425 Speed Del.quantity cm3/ 1000H.: 16,0...20,0

Full-load speed regulation:

1/min: 2100 Speed

Deliquantity cm3/

1000H: 30,5...34,5

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 62,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 0,0...0,8 mm: (0,0...1,1) TD travel

1/min: 1250 2nd speed

mm: 2,5...2,9 mm: (2,2...3,2) 1/min: 1950 TD travel

3rd speed

TD travel mm: 6,0...6,8 mm: (5,7...7,1)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump pressure

bar: 3,1...3,7 1/min: 1000 2nd speed

Supply-pump

pressure bar: 4,8...5,4 1/min: 1250 3rd speed

Supply-pump

bar: 5,6...6,2 1/min: 1950 pressure 4th speed

Supply-pump

bar: 7,7...8,3 pressure

Overflow quantity at overflow valve:

1st speed 1/min: 500 : 55...100 Oveflow cm3/10s: (40...115) quantity 1/min: 1950 2nd speed Overflow 83...153

quantity cm3/10s: (68...168)

Delivery-quant. and breakaway char .:

1/min: 1950 1st speed mm: 10,0 HBA stroke

Del.quantity cm3/: 37,0...40,6 D 1000H.: (36,3...41,3) D 2nd speed 1/min: 2400 Del.quantity cm3/: 0,0...10,0

Del.quantity cms/.

3rd speed 1/min: 2200

cm3/: 18,0...26,0 Del.quantity 1000H.: (16,0...28,0)

4th speed 1/min: 2100

Del.quantity cm3/: 30,3...37,5)

5th speed

1/min: 1950 cm3/: 37,0...40,6 1000H.: (36,3...41,3) Del.quantity

1/min: 1700 6th speed

Del.quantity cm3/: 37,7...41,3 1000H.: (37,0...42,0)

1/min: 1000 7th speed

Del.quantity cm3/: 35/5...38,5) E

8th speed

1/min: 500 cm3/: 30,5...31,5 F 1000H: (26,0...36,0) F Del.quantity

Zero delivery (stop):

Electr. shutoff:

1/min: 425 Speed ELAB volt: -

cm3/: 0,0...3,0Del.quantity

1000H.: max.

Idle delivery:

1st speed 1/min: 425

Del.quantity cm3/: 16,0..20,0

1000H.: (14,0..22,0)

2nd speed 1/min: 500
Del.quantity cm3/: 9,5...17,5
1000H.: (7,5...19,5)

Automatic starting fuel delivery:

1st speed 1/min: 300 Del.quantity cm3/: -1000H: 30,0 ind.

1/min: 480 2nd speed Del.quantity cm3/: -max. 1000H: 34,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

3,2...3,4 mm : K-OT : 1,3...1,7 : 3,8 : 17,0...19,0 **KF** mn MS mm SVS max. mm XK mm XL : 10,9...14,5 mm

Remarks:

Pump/engine assignment: Stroke in blocking position 0.73... 0.83 mm, referenced to outlet "B". Attach timing device cover KDEP 1151.

F = Adjustment point for low full-load delivery

E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw).

D = Adjustment point for high full-

load delivery

Note inst. in remarks column

: FOR 2,5 C Test sheet Edition : 07.11.89 : 12.05.89 replaces Calibrating oil : ISO 4113

: VE 4/11F2000 R288-1 Injection pump

Type number : 0 460 414 052

Customer-specific information

Customer : FORD

: 2,5 DI Engine

TEST BENCH REQUIREMENTS

Calibrating oil

return temp. .. C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 023 assembly

Opening

bar: 172...175 pressure

Perforated-plate

mm : 0.4diameter

Test inj. tubing : 1 680 750 073

Outside diameter x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Start of delivery block mm: 0,78 Piston stroke

mm: 0,73...0,83

Outlet : B

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Setting value mm: 2,5...2,9 Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/ 1000H.: 30,5...31,5 F

Low-idle speed regulation:

1/min: 425 Speed

Del.quantity cm3/ 1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100

Del.quantity cm3/

1000H: 30,5...34,5

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 62,0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800

mm: 0,0...0,8 mm: (0,0...1,1) TD travel

1/min: 1250 2nd speed

mm: 2,5...2,9 mm: (2,2...3,2) 1/min: 1950 TD travel

3rd speed

TD travel

mm: 6,0...6,8 mm: (5,7...7,1)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 3,1...3,7 1/min: 1000 pressure

2nd speed

Supply-pump

pressure bar: 4,8...5,4 1/min: 1250 3rd speed

Supply-pump

bar: 5,6...6,2 1/min: 1950 pressure

4th speed Supply-pump

bar: 7,7...8,3 pressure

# Overflow quantity at overflow valve:

1st speed 1/min: 500 Oveflow : 55...100 quantity cm3/10s: (40...115) 2nd speed 1/min: 1950 Overflow : 83...153 quantity cm3/10s: (68...168)

### Delivery-quant. and breakaway char .:

1st speed 1/min: 1950
HBA stroke mm: 10,0
Del.quantity cm3/: 37,0...40,6 D
1000H.: (36,3...41,3) D
2nd speed 1/min: 2400
Del.quantity cm3/: 0,0...10,0
1000H.: 3rd speed 1/min: 2200
Del.quantity cm3/: 18,0...26,0
1000H.: (16,0...28,0)
4th speed 1/min: 2100
Del.quantity cm3/: 30,5...34,5
1000H.: (27,5...37,5)
5th speed 1/min: 1950
Del.quantity cm3/: 37,0...40,6
1000H.: (36,3...41,3)
6th speed 1/min: 1700
Del.quantity cm3/: 37,7...41,3
1000H.: (37,0...42,0)
7th speed 1/min: 1000
Del.quantity cm3/: 35,5...36,5 E
1000H.: (33,5...38,5) E

8th speed 1/min: 500 Del.quantity cm3/: 30,5...31,5 F 1000H: (26,0...36,0) F

Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 425
ELAB volt: Del.quantity cm3/: 0,0...3,0
max. 1000H.: -

#### Idle delivery:

1st speed 1/min: 425
Del.quantity cm3/: 16,0..20,0
1000H.: (14,0..22,0)
2nd speed 1/min: 500
Del.quantity cm3/: 9,5...17,5
1000H.: (7,5...19,5)

Arrangement of drivers on enginespeed lever for exhaust-gasrecirculation valve linkage (guage) 1st speed 1/min: 1250 Del.quantity cm3/: 23,0..24,0 1000H.: (21,5..26,0)

# Automatic starting fuel delivery:

1st speed 1/min: 300 Del.quantity cm3/: - 1000H: 30,0

2nd speed 1/min: 480 Del.quantity cm3/: - max. 1000H: 34,0

### Shutoff electromagnet:

Cut-in min. voltage : 10,0 Rated voltage : 12,0

# Mounting and assembly dimensions:

Designation : 3,2...3,4 K KF : K-0T MS : 1,3...1,7 mm SVS max. : 3,8 mm : 17,0...19,0 XK mm : 10,9...14,5 XL

#### Remarks:

Pump/engine assignment: Stroke in blocking position 0.73... 0.83 mm, referenced to outlet "B". Attach timing-device cover KDEP 1151.

F = Adjustment point for low full-load delivery
E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw).
D = Adjustment point for high full-load delivery

Adjust part-load delivery: Setting = 12.0 mm

Note inst. in remarks column

: SOF 2,5 R Test sheet : 24.10.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/11F1900 R294 Injection pump

Type number : 0 460 414 054

Customer-specific information

Customer : IVECO

: 8140.27.200 Engine

TEST BENCH REQUIREMENTS

Calibrating oil

return temp. ., C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 1,5...1,9

Supply-pump pressure:

1/min: 1100 Speed

Charge press. hPa: 1000 Setting value bar: 5,8...6,4

Full-load del. with charge press.:

Speed 1/min: 1750 Charge press. hPa: 1000

Del.quantity cm3/ 1000H:: 54,5...55,5 Dispersion cm3/: 3,5 1000H: (4,0)

Full-load del. w/out charge press.:

1/min : 550 Speed

Del.quantity cm3/ 1000H.: 21,0...22,0

Low-idle speed regulation:

1/min: 375 Speed Charge press. hPa: -

Del.quantity cm3/ 1000H: 13,0...17,0 Dispersion cm3/: 3,0 1000H: (3,5)

Full-load speed regulation:

Speed 1/min: 2200 Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 17,5...23,5

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity mind cm3/1000H.: 40,0

Load-dependent start of delivery:

1/min: 1750 Charge press. hPa: 1000

Inspection pump test specifications Test specifications in parentheses

Timing device characteristic:

1/min: 1100 1st speed Charge press. hPa: 1000

TD travel mm: 1,5...1,9 mm: (1,0...2,4) 2nd speed 1/min: 1500 Charge press. hPa: 1000 TD travel

mm: 3,9...4,7 mm: (3,6...5,0)

3rd speed	Charge press. hPa: 1000 Del.quantity cm3/: 53,558,5 1000H.: (52,559,5) 8th speed 1/min: 1000 Charge press. hPa: 1000
Supply-pump pressure characteristic:	Del.quantity cm3/: 52,557,5 1000H: (51,059,0)
1st speed 1/min: 550 Charge press. hPa: 1000 Supply-pump pressure bar: 4,14,7 2nd speed 1/min: 1100 Charge press. hPa: 1000 Supply-pump pressure bar: 5,86,4 3rd speed 1/min: 1750 Charge press. hPa: 1000 Supply-pump pressure bar: 7,78,3 Overflow quantity at overflow valve:	9th speed 1/min: 800 Charge press. hPa: 550 Del.quantity cm3/: 42,043,0 1000H: (38,546,5) 10th speed 1/min: 550 Charge press. hPa: 1000 Del.quantity cm3/: 52,558,5 1000H: (51,559,5) 11th speed 1/min: 550 Charge press. hPa: - Del.quantity cm3/: 21,022,0 1000H: (18,025,0)  Zero delivery (stop):
1st speed 1/min: 550 Charge press. hPa: - Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)	Electr. shutoff:  Speed 1/min: 375 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:
Delivery—quant. and breakaway char.:  1st speed 1/min: 800* Charge—air pressure—setting point hPa: 550 LDA stroke mm: 4,7 Del.quantity cm3/: 42,043,0 1000H.: (38,546,5)  2nd speed 1/min: 2350 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -  3rd speed 1/min: 2200 Charge press. hPa: 1000 Del.quantity cm3/: 17,523,5 1000H.: (16,025,0)  4th speed 1/min: 2100 Charge press. hPa: 1000 Del.quantity cm3/: 35,543,5 1000H.: (33,545,5)  5th speed 1/min: 1900 Charge press. hPa: 1000 Del.quantity cm3/: 50,555,5 1000H.: (49,556,5)  6th speed 1/min: 1750 Charge press. hPa: 1000 Del.quantity cm3/: 54,555,5	1st speed 1/min: 375 Del.quantity cm3/: 13,017,0 1000H.: (11,019,0) 2nd speed 1/min: 450 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 325 Del.quantity cm3/: 37,047,0 1000H.: (36,048,0)  Automatic starting fuel delivery: 1st speed 1/min: 350 Del.quantity cm3/: - ind. 1000H: 42,0  2nd speed 1/min: 450 Del.quantity cm3/: - max. 1000H: 48,0  Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,8  Mounting and assembly dimensions:
1000H.: (51,558,5) 7th speed 1/min: 1500	+ Mounting and assembly dimensions:

	,			_
Designati	m	かつきする	22	no

am	: 3,23,4
mm	: K-0T
mm	: 0,61,0
	: 21,823,8
	: 12,315,7
	mm

### Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: PER 5,0 B1 Test sheet Edition : 06.11.89

replaces

Calibrating oil : ISO 4113

: VE 4/11F1250 R266-2 Injection pump

Type number : 0 460 414 057

Customer-specific information Customer : PERKINS

TEST BENCH REQUIREMENTS

Calibrating oil return temp. ...C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening

bar: 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

Prestroke mm: 0,5 (from BDC): +-0,02(0,04)

Start of delivery block Piston stroke mm: 1,42

mm: +0,02(0,06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100

Setting value mm: 2,4...2,8

Supply-pump pressure:

1/min: 1100 Setting value bar: 4,9...5,5 Full-load del. w/out charge press.:

 $1/\min : 600$ Speed

Del.quantity cm3/

1000H.: 24,0...25,0 cm3/: 3,5

Dispersion

1000H.: -

Low-idle speed regulation:

Speed 1/min: 350

Del.quantity cm3/ 1000H.: 11,0...15,0

cm3/: 3,0 Dispersion

1000H.: -

Full-load speed regulation:

1/min: 1350 Speed

Del.quantity cm3/

1000H: 12,0...18,0

Start:

1/min: 100 Speed

Del.quantity cm3/1000H.: 70,0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700

mm: 0,4...1,2TD travel

mm: (0,1...1,5)

1/min: 1100 2nd speed

mm: 2,4...2,8 mm: (1,9...3,3) TD travel

1/min: 1250 mm: 2,8...3,6 mm: (2,5...3,9) 3rd speed

TD travel

Supply-pump pressure characteristic:

1/min: 700 1st speed

Supply-pump

bar: 3,5...4,1 1/min: 1100 pressure

2nd speed

Supply-pump

bar: 4,9...5,5 1/min: 1250 pressure

3rd speed

Supply-pump

pressure bar: 5,4...6,0

Overflow quantity at overflow valve:

1st speed 1/min: 600

: 41...83 Oveflow quantity cm3/10s: (26...98) 1/min: 1250 2nd speed 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant, and breakaway char.: 1/min: 1430 1st speed Del.quantity cm3/: 0,0...3,0 1000H.: -2nd speed 1/min: 1350 Del.quantity cm3/: 12,0...18,0 1000H.: (10,0...20,0) 3rd speed 1/min: 1250 Del.quantity cm3/: 46,5...49,5 1000H.: (45,0...51,0) 4th speed 1/min: 1100 Del.quantity cm3/: 47,0...50,0 1000H.: (45,5...51,5) 5th speed 1/min: 800 Del.quantity cm3/: 34,0...36,0 Del.quantity cms/: -1/min: 600 6th speed Del.quantity cm3/: 24,0...25,0 1000H.: (22,0...27,0) Zero delivery (stop): Electr. shutoff: Speed 1/min: 350 ELAB volt: -Del.quantity cm3/: u, 1000H.: cm3/: 0.0...3.0Idle delivery: 1st speed 1/min: 350 Del.quantity cm3/: 11,0..15,0 1000H.: (9,0...17,0) 1/min: 400 2nd speed Del.quantity cm3/: 3,0...9,0 1000H.: (1,5...10,5) 1/min: 460 3rd speed Del.quantity cm3/: 0,0...5,0 1000H.: -Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: -1000H: 36,0 ind. 2nd speed 1/min: 400 Del.quantity cm3/: -1000H: 40,0

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : -

MS mm : 1,1...1 SVS max. mm : 4,1

mm

: K-0T

Remarks:

KF

G03

Shutoff electromagnet:

Note inst. in remarks column

: SOF 2,5 K3 : 02.11.89 Test sheet Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 R127-3

: 0 460 414 060 Type number

Customer-specific information Customer : IVECO-SOFIM

Engine : 8140.21.290

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. , C ... with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 023 assembly

Opening |

bar: 172...175 pressure

Perforated plate

diameter mm:0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +0.02(0.04)

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 2,5...2,9

Supply-pump pressure:

1/min: 1100 Speed

Charge press. hPa: 1000 Setting value bar: 4,7...5,3

Full-load del. with charge press.:

1/min: 1100 Speed Charge press. hPa: 1000
Del.quantity cm3/
1000H:: 44,7...45,7
Dispersion cm3/: 3,5

1000H : (4,0)

Full-load del. w/out charge press.:

 $1/\min : 500$ Speed

Del.quantity cm3/

1000H.: 38,5...39,5

Low-idle speed regulation:

1/min: 400 Speed Charge press. hPa: -

Del.quantity cm3/ 1000H.: 13,0...17,0 Dispersion cm3/: 3,0 1000H.: (4,0)

Fulk-load speed regulation:

1/min: 2300 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 15,0...21,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 60,0 mind

Load-dependent start of delivery:

Speed 1/min: 1100 Charge press. hPa: -

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed Charge press. hPa: 1000

TD travel mm: 0,5...1,3 mm: (0,2...1,6)
2nd speed 1/min: 1100
Charge press. hPa: 1000

mm: 2,5...2,9 mm: (2,0...3,4) TD travel

1/min: 1500 3rd speed

Charge press. hPa: 1000	+ Del.quantity cm3/: 42,244,8
TD travel mm: 4,35,1	1000H.: (40,846,2)
	7th speed 1/min: 1100
mm: (4,05,4)	
4th speed 1/min: 1900	Charge press. hPa: 1000
Charge press. hPa: 1000	Del.quantity cm3/: 44,745,7 1000H.: (42,547,9)
TD travel mm: 6,16,9 mm: (5,87,2)	10001.: (42,547,9)
mn: (5,8(,2)	+ 8th speed 1/min: 900
a to a substitute of the subst	+ Charge press. hPa: 400
Supply-pump pressure characteristic:	+ Del.quantity cm3/: 37,538,5
4	1000H: (35,340,7)
1st speed 1/min: 500	+ 9th speed 1/min: 500
Charge press. hPa: 1000	+ Charge press. hPa: 1000
Supply-pump	+ Del.quantity cm3/: 50,754,5
pressure bar: 2,73,3 2nd speed 1/min: 1100	1000H: -
2nd speed 1/min: 1100	+ 10th speed 1/min: 500
Charge press. hPa: 1000	+ Charge press. hPa: -
Supply-pump	+ Del.quantity cm3/: 38,539,5
pressure bar: 4,75,3 3rd speed 1/min: 1900	+ 1000H: (36,341,7)
3rd speed 1/min: 1900	+
Charge press. hPa: 1000	+ Zero delivery (stop):
Supply-pump	+
pressure bar: 7,07,6	+
	+ Electr. shutoff:
Overflow quantity at overflow valve:	
	+ Speed 1/min: 400
1st speed 1/min: 500	+ ELAB volt: -
Charge press. hPa: -	+ Del.quantity cm3/: 0,03,0
Oveflow : 4183	+ max. 1000H.: -
quantity cm3/10s: (2698)	+
2nd speed 1/min: 1900	† Idle delivery:
Charge press. hPa: 1000	+
Overflow : 55138	+ 1st speed 1/min: 400
quantity cm3/10s: (40153)	+ Del.quantity cm3/: 0,05,0
	+ 1000H.: -
Delivery-quant. and breakaway char.:	+ 2nd speed 1/min: 350
	+ Del.quantity cm3/: 27,033,0
1st speed 1/min: 900	Del.quantity cm3/: 27,033,0 1000H.: (25,534,5)
Charge-air pressure-setting	+ 3rd speed 1/min: 550
point hPa: 400	+ Del.quantity cm3/: 0,05,0
Del.quantity cm3/: 37,538,5	1000H.: -
1000H.: (35,540,7)	+
2nd speed 1/min: 2450	+ Automatic starting fuel delivery:
Charge press. hPa: 1000	+
Deliquantity cm3/: 0,05,0	+ 1st speed 1/min: 200
1000H.: -	+ Del.quantity cm3/: -
3rd speed 1/min: 2300	† ind. 1000H: 70,0
Charge press. hPa: 1000	+
Del.quantity cm3/: 15,021,0	+ 2nd speed 1/min: 350
1000H.: (13,522,5)	+ Del.quantity cm3/: -
4th speed 1/min: 2100	+ max. 1000H: 70,0
Charge press. hPa: 1000	+
Del.quantity cm3/: 30,038,0	+ Shutoff electromagnet:
Deliquantity cm3/: 30,038,0 1000H.: (29,538,5)	+
5th speed 1/min: 1900	+ Cut-in
Charge press. hPa: 1000	+ min. voltage : 10,0
Del.quantity cm3/: 41,544,1	+ Rated voltage : 12,0
1000H.: (40,145,5)	+
6th speed 1/min: 1500	+ Mounting and assembly dimensions:
Charge press. hPa: 1000	+
	+ Designation

K mm : KF mm : K-OT
MS mm : 0,8...1,2
SVS max. mm : 4,8

### Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: FOR 2,5 E : 07.11.89 Test sheet Edition : 12.05.89 replaces : ISO 4113 Calibrating oil

: VE 4/11F2000 RR288-3 Injection pump

: 0 460 414 062 Type number

Customer-specific information

Customer : FORD

: 2,5 DI Engine

TEST BENCH REQUIREMENTS

Calibrating oil

return temp. . C . with thermometer : 40...48 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 023 assembly

Opening

bar: 172...175 pressure

Perforated plate

diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Start of delivery block Piston stroke mm: 0,78

mm: 0,73...0,83

**Outlet** : B

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Speed Setting value mm: 2,5...2,9 Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

 $1/\min : 500$ Speed

Del.quantity cm3/ 1000H.: 30,5...31,5 F

Low-idle speed regulation:

1/min: 425 Speed

Del.quantity cm3/ 1000H.: 18,0...22,0

Full-load speed regulation:

Speed 1/min: 2100

Del.quantity cm3/

1000H: 30,5...34,5

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 62,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 0,0...0,8 mm: (0,0...1,1) TD travel

1/min: 1250 2nd speed TD travel

mm: 2,5...2,9 mm: (2,2...3,2)

3rd speed 1/min: 1950 TD travel

mm: 6,0...6,8 mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 3,1...3,7 1/min: 1000 pressure 2nd speed

Supply-pump

bar: 4,8...5,4 1/min: 1250 pressure 3rd speed

Supply-pump

bar: 5,6...6,2 pressure

1/min: 1950 4th speed

Supply-pump pressure bar: 7,7...8,3

Overflow quantity at overflow valve:
1st speed 1/min: 500 Oveflow : 55100 quantity cm3/10s: (40115) 2nd speed 1/min: 1950 Overflow : 83153 quantity cm3/10s: (68168)
Delivery-quant. and breakaway char.:
1st speed 1/min: 1950 HBA stroke mm: 10,0 Del.quantity cm3/: 37,040,6 D 1000H.: (36,341,3) D 2nd speed 1/min: 2400 Del.quantity cm3/: 0,010,0 1000H.: - 3rd speed 1/min: 2200 Del.quantity cm3/: 18,026,0 1000H.: (16,028,0)
4th speed 1/min: 2100 Del.quantity cm3/: 30,534,5 1000H.: (27,537,5) 5th speed 1/min: 1950 Del.quantity cm3/: 37,040,6
1000H.: (36,341,3) 6th speed
7th speed 1/min: 1000 Del.quantity cm3/: 35,536,5 E
Zero delivery (stop):
Electr. shutoff:
Speed 1/min: 425 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -
Idle delivery:
1st speed 1/min: 425 Del.quantity cm3/: 18,022,0 1000H.: (16,024,0) 2nd speed 1/min: 500 Del.quantity cm3/: 11,519,5 1000H.: (9,521,5)
Arrangement of drivers on engine- speed lever for exhaust-gas- recirculation valve linkage (guage)

```
1st speed 1/min: 1250
Del.quantity cm3/: 23,0..24,0
1000H.: (21,5..26,0)
Automatic starting fuel delivery:
1st speed
                 1/min: 300
Del.quantity cm3/: -
                 1000H: 30,0
 ind.
                 1/min: 480
2nd speed
Del.quantity cm3/: -
max. 1000H: 34,0
Shutoff electromagnet:
Cut-in
min. voltage
Rated voltage
                        : 10,0
                        : 12,0
Mounting and assembly dimensions:
Designation
                       : 3,2...3,4
                  mm
                      : K-OT
: 1,3...1,7
: 3,8
: 17,0...19,0
KF
                  mm
MS
                  mm
SVS max.
                  mm
XK
                  mm
                  mm : 10,9...14,5
XL
Remarks:
Pump/engine assignment:
Stroke in blocking position 0.73...
0.83 mm, referenced to outlet "B".
Attach timing-device cover
KDEP 1151.
F = Adjustment point for low full-load
delivery
E = Fuel-delivery adjustment point in
HBA range. (Correction by way of HBA
adjusting screw).
D = Adjustment point for high full-
load delivery
```

Adjust part-load delivery: Setting = 12.0 mm

Note inst. in remarks column

: PER 6,0 D1 : 10.11.89 Test sheet Edition replaces : 10.07.89 Calibrating oil : ISO 4113

: VE 4/11F2250 R327 Injection pump : 0 460 414 065 Type number

Customer-specific information : PERKINS Customer

: PRIMA N/A Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. , C ... 48 with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Openina

pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Start of delivery block Piston stroke mm: 1,1 mm: -

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1800 Speed Setting value mm: 4,2...4,6 KSB solenoid-operated volt: 12,0 valve

Supply-pump pressure:

1/min: 1800 Setting value bar: 6,7...7,3 KSB solenoid-operated valve volt: 12,0

Full-load del. w/out charge press.:

1/min: 450 Speed

Del.quantity cm3/ 1000H.: 32,0...33,0

KSB solenoid-operated volt: 12,0 valve

Low-idle speed regulation:

1/min: 400 Del.quantity cm3/ 1000H.: 7,0...9,0

KSB solenoid operated volt: 12,0 valve

Full-load speed regulation:

Speed 1/min: 2500

Del.quantity cm3/ 1000H: 28,0...30,0

KSB solenoid-operated valve volt: 12,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 70,0 KSB solenoid-operated volt: 12,0 valve

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed

1/min: 500 mm: 1,7...1,9 mm: (1,0...2,6) \* TD travel

KSB solenoid-operated valve volt: -1/min: 1200 2nd speed

mm: 1,4...3,4 \* TD travel

mm: -

KSB solenoid-operated valve volt: -3rd speed 1/min: 1200 mm: 1,1...1,9 mm: (0,8...2,2) TD travel

KSB solenoid-operated volt: 12,0 valve

4th speed 1/min: 1500 +	2nd speed 1/min: 2600
TD travel mm: 2,53,3 mm: (2,23,6)	KSB solenoid-operated
mm: (2,23,6) +	valve volt: 12,0
KSB solenoid-operated	Del.quantity cm3/: 0,015,0 1000H.: -
valve volt: 12,0 5th speed 1/min: 1800	3rd speed 1/min: 2500
TD travel mm: 4,24,6	KSB solenoid-operated
mm: (3,75,1)	valve volt: 12,0
KSB solenoid-operated	Del quantity cm3/: 28.0. 30.0
valve volt: 12,0	Del.quantity cm3/: 28,030,0 1000H.: (25,033,0)
6th speed 1/min: 2250	4th speed 1/min: 1000
TD travel mm: 6,47,2	KSB solenoid-operated
mn: (6,17,5)	valve volt: 12,0
KSB solenoid-operated +	Del.quantity cm3/: 47,548,5 E 1000H.: (45,051,0) E
valve volt: 12,0	1000H.: (45,051,0) E
+	5th speed 1/min: 450
Supply-pump pressure characteristic:	KSB solenoid-operated
†	valve volt: 12,0
1st speed	Del.quantity cm3/: 32,033,0 F
Supply-pump + 57 50	1000H.: (28,536,5) F
pressure bar: 5,35,9	Tono dolivary (atan):
KSB solenoid-operated valve volt: 12,0	Zero delivery (stop):
2nd speed 1/min: 1000	
Supply-pump	Electr. shutoff:
pressure bar: 5,35,9	Cecci i Silacori i
KSB solenoid-operated +	Speed 1/min: 400
valve volt: 12.0	ELAB volt: -
3rd speed 1/min: 1800	Deliquantity cm3/: 0,03,0
Supply-pump +	max. 1000H.: -
pressure bar: $6,77,3$	
KSB solenoid-operated +	Idle delivery:
valve volt: 12,0	
4th speed 1/min: 2250	1st speed 1/min: 400
Supply-pump +	KSB solenoid-operated
pressure bar: 7,58,1	valve volt: 12.0
KSB solenoid-operated	Del.quantity cm3/: 7,09,0 1000H.: (4,012,0)
valve volt: 12,0	2nd speed 1/min: 500
Overflow quantity at overflow valve:	KSB solenoid-operated
over flow quantity at over flow valve.	valve volt: 12.0
1st speed 1/min: 450 +	valve volt: 12,0 Del.quantity cm3/: 1,57,5
KSB solenoid-operated	1000H.: (0,58,5)
valve volt: 12,0	
Oveflow : 72116 +	Automatic starting fuel delivery:
quantity cm3/10s: (57131)	
2nd speed 1/min: 2250 +	1st speed 1/min: 100
KSB solenoid-operated +	KSB solenoid-operated
valve volt: 12,0	valve volt: 12,0
Overflow : 55111 +	Del.quantity cm3/: -
quantity cm3/10s: (40126)	ind. 1000H: 70,0
Dolayan wouldn't and breakayay than	2nd speed 1/min: 400
Delivery-quant. and breakaway char.:	KSB solenoid-operated
1st speed 1/min: 2250	valve volt: 12,0
HBA stroke mm: 10,0	Del.quantity cm3/: -
KSB solenoid-operated +	max. 1000H: 50,0
valve volt: 12,0	
Del.quantity cm3/: 53,558,5 D	Shutoff electromagnet:
4000U . (E2 0 (D 0) p	

Cut-in

min. voltage Rated voltage : 10,0 : 12,0

# Mounting and assembly dimensions:

Designation

: 3,2...3,4 : K-OT : 1,1...1,5 : 20,0...22,0 : 10,5...13,9 K KF MS XK XL mm mm mm mn

# Remarks:

\* Unscrew KSB ball valve 2 mm

Note inst. in remarks column

: SOF 2,5 R1 : 24.10.89 Test sheet Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 R294-1

: 0 460 414 066 Type number

Customer-specific information Customer : IVECO

: 8140,27,200 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value bar: 5,8...6,4

Full-load del. with charge press.:

1/min: 1750 Speed Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 54,5...55,5
Dispersion cm3/: 3,5

1000H : (4,0)

Full-load del. w/out charge press.:

 $1/\min : 550$ Speed

Del.quantity cm3/

1000H.: 21,0...22,0

Low-idle speed regulation:

Speed 1/min: 375 Charge press. hPa: -

Del.quantity cm3/ 1000H.: 13,0...17,0 Dispersion cm3/: 3,0 1000H.: (3,5)

Full-load speed regulation:

1/min: 2200 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 17,5...23,5

Start:

Speed 1/min: 100 Charge press. hPa: -Del.quantity cm3/1000H.: 40,0 mind

Load-dependent start of delivery:

1/min: 1750 Speed Charge press. hPa: 1000

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1100 1st speed Charge press. hPa: 1000 TD travel

mm: 1,5...1,9 mm: (1,0...2,4)

2nd speed 1/min: 1500 Charge press. hPa: 1000 TD travel mm: 3,9...4,7 mm: (3,6...5,0)

3rd speed 1/min: Charge press. hPa: TD travel mm:	1750 1000 5,15,9 (4,86,2)	† † † †	Charge press. hPa: 1000 Del.quantity cm3/: 53,558,5 1000H.: (52,559,5) 8th speed 1/min: 1000 Charge press. hPa: 1000
Supply-pump pressure	e characteristic:	1	Del.quantity cm3/: 52,557,5 1000H: (51,059,0)
1st speed 1/min: Charge press. hPa: Supply-pump pressure bar:	4,14,7	+++++++++++++++++++++++++++++++++++++++	9th speed 1/min: 800 Charge press. hPa: 550 Del.quantity cm3/: 42,043,0 1000H: (38,546,5)
2nd speed 1/min: Charge press. hPa: Supply-pump pressure bar:	1000 5.86.4	<u> </u>	10th speed 1/min: 550 Charge press. hPa: 1000 Del.quantity cm3/: 52,558,5 1000H: (51,559,5)
3rd speed 1/min: Charge press. hPa: Supply-pump pressure bar:	1000	†	11th speed 1/min: 550 Charge press. hPa: - Del.quantity cm3/: 21,022,0 1000H: (18,025,0)
Overflow quantity at		+	Zero delivery (stop):
1st speed 1/min: Charge press. hPa: Oveflow :	550 - 4183	<u> </u>	Electr. shutoff:
quantity cm3/10s: 2nd speed 1/min: Charge press. hPa:	(2698) 1900 1000 55138	+ + + + + + + + + + + + + + + + + + + +	Speed 1/min: 375 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -
Delivery-quant. and		Ī	Idle delivery:
1st speed 1/min: Charge-air pressure- point hPa: LDA stroke mm: Del.quantity cm3/: 1000H.:	-setting 550 4,7	+ + + + + + + + + + + + + + + + + + + +	1st speed 1/min: 375 Del.quantity cm3/: 13,017,0 1000H.: (11,019,0) 2nd speed 1/min: 450 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 325
2nd speed 1/min: Charge press. hPa: Del.quantity cm3/:	2350 1 <b>000</b>	+	Del.quantity cm3/: 37,047,0 1000H.: (36,048,0)
3rd speed 1/min: Charge press. hPa:	- 2200 1000	+ + + + + + + + + + + + + + + + + + + +	Automatic starting fuel delivery:  1st speed
Del.quantity cm3/: 1000H.: 4th speed 1/min: Charge press. hPa:	2100 1000	+	ind. 1000H: 42,0 2nd speed 1/min: 450 Del.quantity cm3/: -
5th speed 1/min:	(33,545,5) 1900	I	max. 1000H: 48,0  Shutoff electromagnet:
Del.quantity cm3/: 1,000H.:	50,555,5 (49,556,5)	+	Cut-in
6th speed 1/min: Charge press. hPa: Del.quantity cm3/:	1000 54,555,5	Ī	min. voltage : 10,0 Rated voltage : 12,0
7th speed 1/min:	(51,558,5)	‡	Mounting and assembly dimensions:

# Designation

K	mm	: 3,23,4
KF	mm	: K-0T
MS	mm	: 0,61,0
XK	mm	: 21,823,8
XL	mm	: 13,717,1

#### Remarks:

Operate control lever after each manifold pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: SOF 2,5 K4 Test sheet : 02.11.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/11F1900 R127-4 Injection pump

: 0 460 414 068 Type number

Customer-specific information : IVECO-SOFIM

: 8140.27 Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. , C .

with thermometer : 40...48 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 023

**Opening** 

bar: 172...175 pressure

Perforated-plate

diameter mm : 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

Prestroke mm : 0,3

(from BDC): +-0.02(0.04)

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 4,4...4,8

Supply-pump pressure:

1/min: 1100 Speed

Charge press. hPa: 1000 Setting value bar: 4,5...5,1

Full-load del. with charge press.:

1/min: 1100 Speed Charge press. hPa: 1000 Del.quantity cm3/

1000H.: 39,0...40,0 cm3/: 3,5

Dispersion

1000H: (4,0)

Full-load del. w/out charge press.:

Speed  $1/\min : 500$ 

Del.quantity cm3/

1000H.: 39,0...40,0

Low-idle speed regulation:

1/min: 350 Speed Charge press. Thus.
Del.quantity cm3/
1000H.: 13,0...17,0
Dispersion cm3/: 3,0 Charge press. hPa: -

1000H.: (4,0)

Full-load speed regulation:

1/min: 2300 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 15,0...19,0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity cm3/1000H.: 60.0 mind

Load-dependent start of delivery:

1/min: 1100 Speed Charge press. hPa: -

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 500 1st speed Charge press. hPa: 1000 TD travel

mm: 1,3...2,1 mm: (1,0...2,4)

2nd speed 1/min: 800 Charge press. hPa: 1000 TD travel

mm: 2,8...3,6 mm: (2,5...3,9)

3rd speed 1/min: 1100	+ Del.quantity cm3/: 37,239,8
ord speed 1/11/11: 1105	T Det. qualitity cliby. 37,237,0
Charge press. hPa: 1000	1000H.: (35,841,2)
TD travel mm: 4,44,8	+ 7th speed 1/min: 1100
(7.0 5.7)	Change proce hPa: 1000
mm: (3,95,3)	Charge press. hPa: 1000 Del.quantity cm3/: 39,040,0 1000H.: (36,842,2)
4th speed 1/min: 1500	+ Deliquantity cm3/: 39,040,0
Charge press. hPa: 1000	1000H (36.8 42.2)
The desired and 4 4 4	9th annual 1/mins 000
TD travel mm: 6,16,9	+ 8th speed 1/min: 900
mm: (5,87,2)	+ Charge press. hPa: 400
, , , , , , , , , , , , , , , , , , ,	Del.quantity cm3/: 38,039,0
O 1	400011. (75. 9. 14. 2)
Supply-pump pressure characteristic:	1000H: (35,841,2)
	+ 9th speed 1/min: 500
1st speed 1/min: 500	+ Charge press. hPa: 1000
	T that ge piess. Hra. 1000
Charge press. hPa: 1000	+ Del.quantity cm3/: 47,250,8
Supply-pump	+ 1000H: -
procesure hors 2.7. 7.7	+ 10th speed 1/min: 500
pressure bar: 2,73,3	
2nd speed 1/min: 1100	+ Charge press. hPa: -
Charge press. hPa: 1000	+ Del.quantity cm3/: 39,040,0
	10000. (7/ 9 /2 2)
Supply-pump	1000H: (36,842,2)
pressure bar: 4,55,1	+
pressure bar: 4,55,1 3rd speed 1/min: 1500	‡ Zero delivery (stop):
ol	T Zero decreery catops:
Charge press. hPa: 1000	†
Supply-pump	+
	+ Electr. shutoff:
pressure bar: 5,66,2	T Clecti. Silutoir.
	+
Overflow quantity at overflow valve:	+ Speed 1/min: 350
over team quarterly at over team valever	
4	
1st speed 1/min: 500	+ Del.quantity_cm3/: 0,03,0
Charge press. hPa: -	+ max. 1000H.: -
Overflow /4 07	100011.
Oveflow : 4183	<b>†</b>
quantity cm3/10s: (2698)	+ Idle delivery:
2nd speed 1/min: 1000	1
2nd speed 1/min: 1900	+
2nd speed 1/min: 1900 Charge press. hPa: 1000	+ 1st speed 1/min: 350
2nd speed 1/min: 1900 Charge press. hPa: 1000	+ 1st speed 1/min: 350
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow: 55138	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0
2nd speed 1/min: 1900 Charge press. hPa: 1000	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5)
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow: 55138	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow: 55138 quantity cm3/10s: (40153)	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow: 55138	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.:	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.:	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.: 1st speed 1/min: 900	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 2300	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 2300 Charge press. hPa: 1000	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.:  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5)	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -  max. 1000H: 65,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -  max. 1000H: 65,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 900 Charge-air pressure-setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2) 2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: - 3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet:
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow :55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5 1000H.: (23,533,5)	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow :55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: -  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5 1000H.: (23,533,5)	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow :55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: —  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5 1000H.: (23,533,5) 5th speed 1/min: 1900	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -  max. 1000H: 65,0  Shutoff electromagnet:  Cut-in  min. voltage : 10,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow :55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: —  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5 1000H.: (23,533,5) 5th speed 1/min: 1900 Charge press. hPa: 1000 Charge press. hPa: 1000	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow :55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: —  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5 1000H.: (23,533,5) 5th speed 1/min: 1900 Charge press. hPa: 1000 Del.quantity cm3/: 36,939,5	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in min. voltage Rated voltage : 10,0 Rated voltage : 12,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow :55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 900 Charge—air pressure—setting point hPa: 400 Del.quantity cm3/: 38,039,0 1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0 1000H.: —  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0 1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5 1000H.: (23,533,5) 5th speed 1/min: 1900 Charge press. hPa: 1000 Del.quantity cm3/: 36,939,5	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in min. voltage Rated voltage : 10,0 Rated voltage : 12,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 900 Charge-air pressure-setting     point hPa: 400 Del.quantity cm3/: 38,039,0     1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0     1000H.: -  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0     1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5     1000H.: (23,533,5) 5th speed 1/min: 1900 Charge press. hPa: 1000 Del.quantity cm3/: 36,939,5     1000H.: (35,540,9)	1st speed 1/min: 350  Del.quantity cm3/: 13,017,0  1000H.: (10,519,5)  2nd speed 1/min: 300  Del.quantity cm3/: 27,035,0  1000H.: (26,036,0)  3rd speed 1/min: 500  Del.quantity cm3/: 0,05,0  1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 300  Del.quantity cm3/: -  ind. 1000H: 60,0  2nd speed 1/min: 400  Del.quantity cm3/: -  max. 1000H: 65,0  Shutoff electromagnet:  Cut-in  min. voltage : 10,0
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery—quant. and breakaway char.:  1st speed 1/min: 900 Charge—air pressure—setting     point hPa: 400 Del.quantity cm3/: 38,039,0     1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0     1000H.: —  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0     1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5     1000H.: (23,533,5) 5th speed 1/min: 1900 Charge press. hPa: 1000 Del.quantity cm3/: 36,939,5     1000H.: (35,540,9) 6th speed 1/min: 1500	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in min. voltage Rated voltage : 10,0 Rated voltage : 12,0  Mounting and assembly dimensions:
2nd speed 1/min: 1900 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 900 Charge-air pressure-setting     point hPa: 400 Del.quantity cm3/: 38,039,0     1000H.: (35,841,2)  2nd speed 1/min: 2450 Charge press. hPa: 1000 Del.quantity cm3/: 0,05,0     1000H.: -  3rd speed 1/min: 2300 Charge press. hPa: 1000 Del.quantity cm3/: 15,019,0     1000H.: (12,521,5) 4th speed 1/min: 2150 Charge press. hPa: 1000 Del.quantity cm3/: 24,532,5     1000H.: (23,533,5) 5th speed 1/min: 1900 Charge press. hPa: 1000 Del.quantity cm3/: 36,939,5     1000H.: (35,540,9)	1st speed 1/min: 350 Del.quantity cm3/: 13,017,0 1000H.: (10,519,5) 2nd speed 1/min: 300 Del.quantity cm3/: 27,035,0 1000H.: (26,036,0) 3rd speed 1/min: 500 Del.quantity cm3/: 0,05,0 1000H.: -  Automatic starting fuel delivery: 1st speed 1/min: 300 Del.quantity cm3/: - ind. 1000H: 60,0  2nd speed 1/min: 400 Del.quantity cm3/: - max. 1000H: 65,0  Shutoff electromagnet: Cut-in min. voltage Rated voltage : 10,0 Rated voltage : 12,0

## Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: SOF 2,5 P5 Test sheet : 24.10.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/11F1900 R350 Injection pump

Type number : 0 460 414 070

Customer-specific information Customer : IVECO-SOFIM

: 8140.27 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. \_,C ... with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening |

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 073

Outside diameter x Wall thickness : 2 mm: 450 x Length

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 2.5...2.9 Setting value

Supply-pump pressure:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value bar: 5.6...6.2

Full-load del. with charge press.:

Speed 1/min: 1750 Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 55.0...56.0

cm3/: 3.5Dispersion 1000H: (4.0)

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/

1000H.: 16.5...17.5

Low-idle speed regulation:

1/min: 325 Speed

Del.quantity cm3/

1000H.: 10.0...14.0

cm3/: 3.0Dispersion

1000H.: (3.5)

Full-load speed regulation:

Speed 1/min: 2100 Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 19.5...25.5

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 40.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900 Charge press. hPa: 1000

mm: 1.1...1.9 TD travel

mm: (0.8...2.2)

1/min: 1100 2nd speed Charge press. hPa: 1000

TD travel mm: 2.5...2.9

mm: (2.0...3.4)

1/min: 1900 3rd speed hPa: 1000 Charge press. mm: 7.1...7.9 TD travel

mm: (6.8...8.2)

Supply-pump pressure characteristic:

1st speed 1/min: 500 Charge press. hPa: 1000

Supply-pump pressure bar: 3.64.2 bar: (3.34.5)	+ 9th speed 1/min: 500 + Charge press. hPa: 1000 + Del.quantity cm3/: 48.554.5
2nd speed 1/min: 1100 Charge press. hPa: 1000 Supply-pump	1000H: (47.555.5) 10th speed 1/min: 500 Charge press. hPa: -
pressure bar: 5.66.2 bar: (5.36.5)	Del.quantity cm3/: 16.517.5 1000H: (13.520.5)
3rd speed 1/min: 1900 Charge press. hPa: 1000 Supply-pump	Zero delivery (stop):
pressure bar: 7.68.2 bar: (7.38.5)	Electr. shutoff:
Overflow quantity at overflow valve:	Speed 1/min: 325 ELAB volt: -
1st speed 1/min: 500 Charge press. hPa: -	Del.quantity cm3/: 0.03.0 max. 1000H.: -
Oveflow : 4183 quantity cm3/10s: (2698)	Idle delivery:
2nd speed 1/min: 1900 Charge press. hPa: 1000	1st speed 1/min: 325
Overflow : 55138	+ Del.quantity cm3/: 3141
quantity cm3/10s: (40153)	Del.quantity cm3/: 3141 1000H.: (3042) 2nd speed 1/min: 325
Delivery-quant. and breakaway char.:	Del.quantity cm3/: 1014 1000H.: (8.016.0)
1st speed 1/min: 800*	+ 3rd speed 1/min: 450
Charge-air pressure-setting	+ Del.quantity cm3/: 0.05.0 1000H.: (0.05.0)
point hPa: 400	1000h.: (0.05.0)
Del.quantity cm3/: 42.543.5 1000H.: (39.047.0)	Arrangement of drivers on engine-
2nd speed 1/min: 2350 Charge press. hPa: 1000	<pre>speed lever for exhaust-gas- recirculation valve linkage (guage)</pre>
Del.quantity cm3/: 0.05.0	Tech cutation valve thinkage (guage)
1000H.: (0.05.0)	+ 1st speed 1/min: 1000
3rd speed 1/min: 2100	Charge press. hPa: 1000
Charge press. hPa: 1000	+ Del.quantity cm3/: 6.17.1
Del.quantity cm3/: 19.525.5 1000H.: (18.027.0)	1000H.: (3.110.1)
4th speed 1/min: 2000	+ Automatic starting fuel delivery:
Charge press. hPa: 1000	100
Del.quantity cm3/: 40.048.0	1st speed 1/min: 300
1000H.: (38.050.0) 5th speed 1/min: 1900	+ Del.quantity cm3/: - + ind. 1000H: 40.0
Charge press. hPa: 1000	T 114. 100011. 40.0
Del.quantity cm3/: 51.056.0	+ 2nd speed 1/min: 400
1000H.: (50.057.0)	+ Del.quantity cm3/: -
6th speed 1/min: 1750	+ max. 1000H: 45.0
Charge press. hPa: 1000	+
Del.quantity cm3/: 55.056.0 1000H.: (52.059.0)	+ Shutoff electromagnet:
7th speed 1/min: 1500	+ Cut-in
Charge press. hPa: 1000	† min. voltage : 10.0
Del.quantity cm3/: 52.557.5	+ Rated voltage : 12.0
1000H.: (51.558.5)	Maymaina and accepts discussions
8th speed 1/min: 1000	Mounting and assembly dimensions:
Charge press. hPa: 1000	I Designation
Deliquantity cm3/: 49.554.5 1000H: (48.056.0)	Designation K mm: 3.23.4

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: FOR 2,5 F : 07.11.89 Test sheet Edition replaces

Calibrating oil : ISO 4113

: VE 4/11F2000 R366 Injection pump

Type number : 0 460 414 073

Customer-specific information

Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating oil

return temp. .,C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 023 assembly

Opening |

bar: 172...175 pressure

Perforated plate

mm : 0.4diameter

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -(from BDC): -

Start of delivery block mm: 0,78 Piston stroke

mm: 0,73...0,83

**Outlet** : B

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Setting value mm: 2,5...2,9 Supply-pump pressure:

1/min: 1250 Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

 $1/\min : 500$ Speed

Del.quantity cm3/

1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425

Del.quantity cm3/

1000H.: 16,0...20,0

Full-load speed regulation:

1/min: 2100 Speed

Del.quantity cm3/

1000H: 30,5...34,5

Start:

Speed 1/min: 100 Del.quantity

mind cm3/1000H.: 62,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 0,0...0,8 TD travel

mm: (0,0...1,1)1/min: 1250 2nd speed

TD travel

mm: 2,5...2,9 mm: (2,2...3,2)

1/min: 1950 3rd speed TD travel mm: 6,0...6,8

mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 3,1...3,7 1/min: 1000 pressure

2nd speed

Supply-pump

pressure bar: 4,8...5,4 1/min: 1250

3rd speed

Supply-pump bar: 5,6...6,2 pressure

1/min: 1950 4th speed

amua-vJaauZ bar: 7,7...8,3 pressure

1	1
Overflow quantity at overflow valve:	1st speed
1st speed 1/min: 500 Oveflow : 55100	1000H.: (21,526,0)
quantity cm3/10s: (40115) 2nd speed	Automatic starting fuel delivery:
Overflow : 83153 - quantity cm3/10s: (68168) -	- 1st speed 1/min: 300 Del.quantity cm3/: -
	- ind. 1000H: 30,0
Delivery-quant. and breakaway char.:	2nd speed 1/min: 480
1st speed 1/min: 1950 HBA stroke mm: 10,0	- Del.quantity cm3/: - - max. 1000H : 34,0
Del.quantity cm3/: 37,040,6 D - 1000H.: (36,341,3) D -	- Shutoff electromagnet:
2nd speed 1/min: 2400 -	
1000H.: - 3rd speed 1/min: 2200	min. voltage : 10,0 Rated voltage : 12,0
Del.quantity cm3/: 18,026,0	Mounting and anomaly dimensions:
1000H.: (16,028,0) 4th speed 1/min: 2100	Mounting and assembly dimensions:
4th speed 1/min: 2100 - Del.quantity cm3/: 30,534,5 - 1000H.: (27,537,5) -	Designation mm : 3,23,4
5th speed	- KF mm : K-OT - MS mm : 1,31,7
1000H.: (36,341,3) - 6th speed 1/min: 1700 -	min. voltage : 10,0 Rated voltage : 12,0  Mounting and assembly dimensions:  Designation K mm : 3,23,4 KF mm : K-OT MS mm : 1,31,7 SVS max. mm : 3,8 XK mm : 17,019,0 XL mm : 10,914,5
Del.quantity cm3/: 37,741,3 1000H.: (37,042,0)	- XL mm : 10,914,5
7th speed 1/min: 1000 - Del.quantity cm3/: 35,536,5 E	- Remarks:
1000H.: (33,538,5) E	- Pump/engine assignment:
8th speed 1/min: 500 Del.quantity cm3/: 30,531,5 F	Stroke in blocking position 0.73  0.83 mm, referenced to outlet "B".
1000H: (26,036,0) F	- Attach timing-device cover - KDEP 1151.
Zero delivery (stop):	-
Electr. shutoff:	<pre>F = Adjustment point for low full-load</pre>
Speed 1/min: 425	<ul><li>delivery</li><li>E = Fuel-delivery adjustment point in</li></ul>
ELAB volt: - Del.quantity cm3/: 0,03,0	- HBA range. (Correction by way of HBA adjusting screw).
max. 1000H.: -	- D = Adjustment point for high full- load delivery
Idle delivery:	- toad decivery
1st speed	- Adjust part-load dolivery
1000H.: (14,022,0)	<ul><li>Adjust part-load delivery:</li><li>Setting = 12.0 mm</li></ul>
2nd speed 1/min: 500 Del.quantity cm3/: 9,517,5	• •
1000H.: (7,519,5)	<u>-</u>

Arrangement of drivers on engine-speed lever for exhaust-gas-recirculation valve linkage (guage)

Note inst. in remarks column

: FOR 2,5 G : 07.11.89 Test sheet Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R366-1

Type number : 0 460 414 074

Customer-specific information

Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ... C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 023 assembly

**Opening** 

bar: 172...175 pressure

Perforated plate

mm : 0.4diameter

Test inj. tubing : 1 680 750 073

Outside diameter x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm : -

(from BDC): -

Start of delivery block Piston stroke mm: 0,78

mm: 0,73...0,83

Outlet : B

Injection pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1250 Speed Setting value mm: 2,5...2,9 Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

 $1/\min : 500$ Speed

Del.quantity cm3/ 1000H.: 30,5...31,5 F

Low-idle speed regulation:

1/min: 425 Speed

Del.quantity cm3/ 1000H.: 18,0...22,0

Full-load speed regulation:

Speed 1/min: 2100

Del.quantity cm3/

1000H: 30,5...34,5

Start:

Speed 1/min: 100 Del.quantity

cm3/1000H.: 62,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

TD travel mm: 0,0...0,8mm: (0,0...1,1)

1/min: 1250 2nd speed

mm: 2,5...2,9 mm: (2,2...3,2) TD travel

1/min: 1950 3rd speed

TD travel mm: 6,0...6,8

mm: (5,7...7,1)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 3,1...3,7 1/min: 1000 pressure 2nd speed

Supply-pump

bar: 4,8...5,4 1/min: 1250 pressure

3rd speed Supply-pump

bar: 5,6...6,2 pressure

1/min: 1950 4th speed

Supply-pump bar: 7,7...8,3 pressure

Overflow quantity at overflow valve:
1st speed 1/min: 500 Oveflow : 55100 quantity cm3/10s: (40115) 2nd speed 1/min: 1950 Overflow : 83153 quantity cm3/10s: (68168)
Delivery-quant. and breakaway char.:
1st speed 1/min: 1950 HBA stroke mm: 10,0 Del.quantity cm3/: 37,040,6 D 1000H.: (36,341,3) D 2nd speed 1/min: 2400 Del.quantity cm3/: 0,010,0
1000H.: - 3rd speed
4th speed
5th speed 1/min: 1950 Del.quantity cm3/: 37,040,6 1000H.: (36,341,3)
6th speed 1/min: 1700 Del.quantity cm3/: 37,741,3 1000H.: (37,042,0)
7th speed 1/min: 1000 Del.quantity cm3/: 35,536,5 E 1000H.: (33,538,5) E
8th speed 1/min: 500 Del.quantity cm3/: 30,531,5 F 1000H: (26,036,0) F
Zero delivery (stop):
Electr. shutoff:
Speed 1/min: 425 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -
Idle delivery:
1st speed 1/min: 425 Del.quantity cm3/: 18,022,0 1000H.: (16,024,0) 2nd speed 1/min: 500 Del.quantity cm3/: 11 5 19 5
Del.quantity cm3/: 11,519,5 1000H.: (9,521,5)

Arrangement of drivers on enginespeed lever for exhaust-gasrecirculation valve linkage (guage)

1st speed 1/min: 1250 Del.quantity cm3/: 23,0..24,0 1000H.: (21,5..26,0) Automatic starting fuel delivery: 1/min: 300 1st speed Del.quantity cm3/: -1000H: 30,0 ind. 1/min: 480 2nd speed Del.quantity cm3/: -max. 1000H: 34,0 Shutoff electromagnet: Cut-in min. voltage Rated voltage : 10,0 : 12,0 Mounting and assembly dimensions: Designation : 3,2...3,4 K mm mm : K-OT mm : 1,3...1,7 mm : 3,8 mm : 17,0...19,0 mm : 10,9...14,5 KF MS SVS max. XK XL Remarks: Pump/engine assignment: Stroke in blocking position 0.73... 0.83 mm, referenced to outlet "B". Attach timing-device cover KDEP 1151. F = Adjustment point for low full-load delivery E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw).
D = Adjustment point for high fullload delivery

Adjust part-load delivery: Setting = 12.0 mm

Note inst. in remarks column

Test sheet : FOR 2,5 H Edition : 07.11.89

replaces : -

Calibrating oil : ISO 4113

Injection pump : VE 4/11F2000 R366-2

Type number : 0 460 414 075

Customer-specific information

Customer : FORD

Engine : 2,5 DI

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ., C .

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 023

**Opening** 

pressure bar: 172...175

Perforated plate

diameter mm: 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm : 450

Start of delivery
Prestroke mm: (from BDC): -

Start of delivery block Piston stroke mm: 0,78

mm: 0,73...0,83

Outlet : B

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250 Setting value mm: 2,5...2,9 Supply-pump pressure:

Speed 1/min: 1250 Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 500

Del.quantity cm3/

1000H.: 30,5...31,5 F

Low-idle speed regulation:

Speed 1/min: 425

Del.quantity cm3/

1000H.: 16,0...20,0

Full-load speed regulation:

Speed 1/min: 2100

Del.quantity cm3/

1000H: 30,5...34,5

Start:

Speed 1/min: 100 Del.quantity : mind cm3/1000H.: 62,0

Inspection-pump test specifications Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 800

TD travel mm: 0,0...0,8 mm: (0,0...1,1)

2nd speed 1/min: 1250

TD travel mm: 2,5...2,9 mm: (2,2...3,2)

3rd speed 1/min: 1950

TD travel mm: 6,0...6,8 mm: (5,7...7,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

pressure bar: 3,1...3,7 2nd speed 1/min: 1000

Supply-pump

pressure bar: 4,8...5,4
3rd speed 1/min: 1250

Supply-pump

pressure bar: 5,6...6,2

4th speed 1/min: 1950 Supply-pump

pressure bar: 7,7...8,3

	+ Del.quantity cm3/: -
Overflow quantity at overflow valve:	ind. 1000H: 30,0
1st speed 1/min: 500 Oveflow : 55100	2nd speed 1/min: 480
quantity cm3/10s: (40115)	+ Del.quantity cm3/: - + max. 1000H: 34,0
2nd speed 1/min: 1950 Overflow: 83153	+ Shutoff electromagnet:
quantity cm3/10s: (68168)	+
Delivery-quant. and breakaway char.:	+ Cut-in + min. voltage : 10,0 + Rated voltage : 12,0
1st speed 1/min: 1950 HBA stroke mm: 10,0	Mounting and assembly dimensions:
Del.quantity cm3/: 37,040,6 D 1000H.: (36,341,3) D	+ Designation
2nd speed 1/min: 2400	+ K mn: 3,23,4
Del.quantity cm3/: 0,010,0 1000H.: -	+ KF mm : K-OT + MS mm : 1,31,7
3rd speed 1/min: 2200	+ SVS max. mm : 3,8
Del.quantity cm3/: 18,026,0 1000H.: (16,028,0)	+ XK mm : 17,019,0 + XL mm : 10,914,5
4th speed 1/min: 2100	+
Del.quantity cm3/: 30,534,5 1000H.: (27,537,5)	Remarks:
5th speed	- Pump/engine assignment:
Del.quantity cm3/: 37,040,6 1000H.: (36,341,3)	+ Stroke in blocking position 0.73 + 0.83 mm, referenced to outlet "B".
6th speed 1/min: 1700	Attach timing device cover
Del.quantity cm3/: 37,741,3 1000H.: (37,042,0)	+ KDEP 1151.
7th speed 1/min: 1000	+
7th speed 1/min: 1000 Del.quantity cm3/: 35,536,5 E 1000H.: (33,538,5) E	F = Adjustment point for low full-load
oth speed 1/11171; 500	+ delivery
Del.quantity cm3/: 30,531,5 F 1000H: (26,036,0) F	# E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA
Zono dolivomy (cton):	<pre>adjusting screw). D = Adjustment point for high full-</pre>
Zero delivery (stop):	toad delivery
Electr. shutoff:	İ
	+
Speed 1/min: 425 ELAB volt: -	<u> </u>
Del.quantity cm3/: 0,03,0	+
max. 1000H.: -	1
Idle delivery:	+
1st speed 1/min: 425	Ī
Del.quantity cm3/: 16,020,0	<u>†</u>
1000H.: (14,022,0)  2nd speed 1/min: 500	Ŧ
Del.quantity cm3/: 9,517,5 1000H.: (7,519,5)	1
	<u>†</u>
Automatic starting fuel delivery:	Ŧ
1st speed 1/min: 300	+

Note inst. in remarks column

: VOL 4,1 H1 Test sheet : 18.07.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 6/11F1900 L218-8 Injection pump

: 0 460 416 065 Type number

Customer-specific information Customer : PENTA

: TAMD 41B Engine

k: 132 Power

Speed 1/mi: -

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. "C.

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0,35

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

bar: 130...133 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery

Prestroke

e mm: 0,3 (from BDC): +0,02(0,04)

Injection-pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1200 Speed Charge press. hPa: 1000 Setting value mm: 2,0...2,4

Supply-pump pressure:

1/min: 1200 Speed

Charge press. hPa: 1000 Setting value bar: 5,9...6,5

Full-load del. with charge press.:

Speed 1/min: 1500 Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 88,0...89,0

cm3/ : 5,0 1000H : -Dispersion

Full-load del. w/out charge press.:

 $1/\min : 650$ Speed

Del.quantity cm3/ 1000H.: 58,5...59,5

Low-idle speed regulation:

1/min: 325 Speed Charge press. hPa: Del.quantity cm3/
1000H.: 25,0...29,0

Full-load speed regulation:

1/min: 2050 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 67,0...73,0

Start:

1/min: 100 Speed Del.quantity

cm3/1000H.: 80,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000 Charge press. hPa: 1000

TD travel mm: 0,6...1,6mm: (0,4...1,8)

1/min: 1200 2nd speed Charge press. hPa: 1000

mm: 2,0...2,4 mm: (1,5...2,9) TD travel

3rd speed 1/min: 1700 Charge press. hPa: 1000

mm: 3,5...4,3 mm: (3,2...4,6) 1/min: 1900 TD travel

4th speed Charge press. hPa: 1000

TD travel mm: 3,7...4,5

mm: -

Supply-pump pressure characteristic:	Del.quantity cm3/: 92,095,0 1000H.: (90,596,5)
1st speed 1/min: 500	8th speed 1/min: 800
Charge press. hPa: 1000	Charge press. hPa: 200
Supply-pump -	Del quantity cm3/: 72.5 73.5
pressure har 42 48	Del.quantity cm3/: 72,573,5 1000H: (70,076,0)
pressure bar: 4,24,8 - 2nd speed 1/min: 1000 -	9th speed 1/min: 800
Change proces hear 1000	Charge press. hPa: 1000
Charge press. hPa: 1000	Del.quantity cm3/: 78,581,5
Supply-pump -	1 0000 (77 0 07 0)
pressure bar: 5,56,1	1000H: (77,083,0)
3rd speed 1/min: 1200 -	10th speed 1/min: 650
Charge press. hPa: 1000	Charge press. hPa: -
Supply-pump -	Del.quantity cm3/: 58,559,5
pressure bar: 5,96,5 - 4th speed 1/min: 1900 -	1000H: (56,062,0)
4th speed	
Charge press. hPa: 1000	Zero delivery (stop):
Supply-pump -	<del> </del>
pressure bar: 7,48,0	Mech. shutoff:
Overflow quantity at overflow valve:	Speed 1/min: 1900
over teen qualities, as ever teen tactor	Del.quantity cm3/: 03
1st speed 1/min: 650 -	1000H.: -
Charge press. hPa: 1000	10001111
Oveflow : 4183	Electr. shutoff:
quantity cm3/10s: (2698)	Lecti Sideoi i
2nd speed 1/min: 1900	Speed 1/min: 325
Change phase heat 1000	ELAB Volt: -
Charge press. hPa: 1000 - Overflow : 55138 -	Del.quantity cm3/: 0,03,0
quantity cm3/10s: (40153) -	max. 1000H.: -
Delivery-quant. and breakaway char.:	Idle delivery:
1st speed 1/min: 800* -	1st speed 1/min: 325
Charge-air pressure-setting -	Del.quantity cm3/: 25,029,0
point hPa: 200 -	1000H.: (22,032,0)
LDA stroke mm: 4,5	2nd speed 1/min: 400
Del quantity cm3/272.5 73.5	Del quantity cm3/ 5.0 11.0
Del.quantity cm3/: 72,573,5 1000H.: (70,076,0)	Del.quantity cm3/: 5.011.0 1000H.: (3,512,5)
2nd speed 1/min: 2200 -	3rd speed 1/min: 480
Charge proce heat 1000	Del.quantity cm3/: 0,03,0
Charge press. hPa: 1000 Del.quantity cm3/: 0,04,0	1000H.: -
1000H.: -	100011.
3rd speed 1/min: 2150	Automatic starting fuel delivery:
Charge press. hPa: 1000	L Adiomatic stateting fact detivery.
Deliquentity cm3/: 4,511,5	1st speed 1/min: 300
1000H.: -	- Del.quantity cm3/: - ind. 1000H: 70,0
4th speed 1/min: 2050	ind. 1000H: 70,0
Charge press. hPa: 1000	2nd aread 1/mins 500
Del.quantity cm3/: 67,073,0	2nd speed 1/min: 500
1000H.: (64,076,0)	Del.quantity cm3/: -
5th speed 1/min: 1900	max. 1000H: 70,0
Charge press. hPa: 1000	Class of all and a second
Del.quantity_cm3/: 79,083,0	Shutoff electromagnet:
1000H.: (77,085,0)	
6th speed 1/min: 1500	- Cut-in
Charge press. hPa: 1000	min. voltage : 10,0
Del.quantity cm3/: 88,089,0	Rated voltage : 12,0
1000H.: (86,290,8)	<b>,</b>
7th speed	<ul> <li>Mounting and assembly dimensions:</li> </ul>

Designation K KF MS XK mm : K-0T mm : 0,6...1,0 : 21,8...23,8 : 11,2...14,6 m mm XL mm

#### Remarks:

Operate control lever after each manifold pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CLM 3,9 E2 : 02.11.89 Test sheet Edition : 11.12.86 replaces Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R226-2

: 0 460 424 024 Type number

Customer-specific information

Customer : CDC

Engine : 4 BT 390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. \_,C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm : 0,3Prestroke

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1.8

mm: +-0.02(0.06)

**Outlet** : A

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900

Setting value mm: 2,0...2,4

Supply-pump pressure:

1/min: 900 Speed Setting value bar: 4,6...5,2

Full-load del. with charge press.:

Speed 1/min: 1100

Del.quantity cm3/ 1000H.: 68,5...69,5

cm3/:4,0Dispersion

1000H : (4.5)

Low-idle speed regulation:

1/min: 335 Speed

Deliquantity cm3/

1000H.: 8,0...14,0

cm3/: 5,5 Dispersion 1000H.: (7,0)

Full-load speed regulation:

1/min: 1290 Speed

Del.quantity cm3/

1000H: 58,0...64,0

Start:

Speed 1/min: 100 Del.quantity

cm3/1000H.: 70,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 750 1st speed

TD travel mm: 0,8...1,6 mm: (0,5...1,9)

1/min: 900 2nd speed

mm: 2,0...2,4 mm: (1,5...2,9) 1/min: 1100 mm: 2,9...3,7 mm: (2,6...4,0) TD travel

3rd speed TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2,7...3,3 1/min: 750 pressure

2nd speed Supply-pump

bar: 3,9...4,5 1/min: 900 pressure

3rd speed

Supply-pullio bar: 4,6...5,2 pressure 1/min: 500 1/min: 1100 2nd speed 4th speed Supply-pump bar: 5,4...6,0 pressure Overflow quantity at overflow valve: 1/min: 500 1st speed 1/min: 130 1st speed Oveflow : 41...83 Del.quantity cm3/: -1000H: 75,0 quantity cm3/10s: (26...98) ind. 1/min: 1250 2nd speed : 55...138 1/min: 300 Overflow 2nd speed Del.quantity cm3/: -max. 1000H: 80,0 quantity cm3/10s: (40...153) max. Delivery-quant. and breakaway char.: Shutoff electromagnet: 1/min: 1450 1st speed cm3/: 0,0...3,0Cut-in Del.quantity 1000H.: -: 10,0 min. voltage 2nd speed 1/min: 1400 Rated voltage : 12,0 2nd special Del.quantity cms/: 0 cm3/: 0,0...15,0 1/min: 1360 3rd speed Del.quantity cm3/: 15,0...55,0 Designation 1000H.: K mm KF 1/min: 1290 mm 4th speed Del.quantity cm3/: 58,0...64,0 1000H.: (55,0...67,0) MS SVS max. Hilli 1/min: 1250 5th speed XK mm cm3/: 66,5...69,5 1000H.: (65,0...71,0) Del.quantity XL mm 1/min: 1100 Remarks: 6th speed Del.quantity cm3/: 68,5...69,5 1000H.: (66,0...72,0) 1/min: 750 7th speed Del.quantity cm3/: 73,0...77,0 1000H.: (71,0...79,0) 8th speed 1/min: 500 Del.quantity cm3/: 74,0...82,0 1000H: (72,0...84,0) Zero delivery (stop): Mech. shutoff: 1/min: 1250 Speed Del.quantity cm3/: -1000H.: 0..3 Electr. shutoff: 1/min: 335 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 1000H .: -Idle delivery:

1st speed

**H03** 

1/min: 335

Del.quantity cm3/: 0,0...3,0 1000H.: \_\_\_ Del.quantity cm3/: 0,0...4,0 1000H.: -Automatic starting fuel delivery: Mounting and assembly dimensions: : 5,0...5,4 : 0,8...1,2 : 4,2 : 18,8...20,8 : 11,5...14,9 : C.D.C. # 390 8183

Note inst. in remarks column

Test sheet : CUM 3.9 P : 20.10.89 Edition

replaces

Calibrating oil : ISO 4113

: VE 4/12F1250 R359 Injection pump

Type number : 0 460 905 027

Customer-specific information

Customer : CDC

Engine : 4 BTA

TEST BENCH REQUIREMENTS

Calibrating oil

return temp. "C. with thermometer : 40...48

electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina |

bar: 250...253 pressure

Perforated-plate

mm : 0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2

mm: 840 x Length

Start of delivery block mm: 1.25 Piston stroke

mm: +0.02(0.06)

Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed Charge press. hPa: 1000 Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 1000 Charge press. hPa: 1000 Setting value bar: 4.9...5.5

Full-load del. with charge press.:

1/min: 850 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 83.0...84.0

cm3/: 4.0Dispersion

1000H : (4.5)

Full-load del. w/out charge press.:

 $1/\min : 500$ 

Del.quantity cm3/

1000H.: 53.0...54.0

Low-idle speed regulation:

Speed 1/min: 375 Charge press. hPa: -

Del.quantity cm3/

1000H.: 10.0...12.0

cm3/: 5.5 1000H.: (7.0) Dispersion

Full-load speed regulation:

1/min: 1330 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 68.0...74.0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity mind cm3/1000H.: 80.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 400 1st speed Charge press. hPa: -

mm: 2.9...3.9 TD travel

mm: -

KSB solenoid-operated volt: valve 1/min: 1000 2nd speed Charge press. hPa: 1000

mm: 1.9...1.7 mm: (0.6...2.0) TD travel

KSB solenoid-operated volt: 12 valve

3rd speed 1/min: 1100	1 Del.quantity cm3/: 0.03.0
	+ Del.quantity cm3/: 0.03.0 + 1000H.: -
Charge press. hPa: 1000	T 70000.
TD travel mm: 2.02.4	+ 3rd speed 1/min: 1430
mm: (1.52.9)	+ Charge press. hPa: 1000
KSB solenoid-operated	+ KSB solenoid-operated
valve volt: 12	+ valve volt: 12
4th speed 1/min: 1250	→ Del.guantity cm3/: 15.045.0
Charge press. hPa: 1000	Del.quantity cm3/: 15.045.0
The American Section 2007	7 /4h amand 4/mins 1770
TD travel mm: 2.83.6	+ 4th speed 1/min: 1330
mm: (2.53.9)	Charge press. hPa: 1000
KSB solenoid-operated	+ KSB solenoid-operated
volve volta 12	+ valve volt: 12
valve volt: 12	T Valve Volt: 12
	+ Deliquantity cm3/: 68.0/4.0
Supply pump pressure characteristic:	Del.quantity cm3/: 68.074.0 1000H.: (65.077.0)
complety processes contained to the second	+ 5th speed 1/min: 1250
4 4 1 500	
1st speed 1/min: 500	+ Charge press. hPa: 1000
Charge press. hPa: 1000	+ KSB solenoid-operated
Supply-pump	+ valve volt: 12
pressure bar: 2.63.2	+ Del.quantity cm3/: 76.579.5
KSB solenoid-operated	+ 1000H.: (75.081.0)
valve volt: 12	+ 6th speed 1/min: 1100
2nd speed 1/min: 1000	+ Charge press. hPa: 1000
Charge press. hPa: 1000	+ KSB solenoid-operated
Supply-pump	+ valve volt: 12
pressure bar: 4.95.5	Dal guardity and/: 77 5 80 5
	Del.quantity cm3/: 77.580.5
KSB solenoid-operated	+ 1000H.: (75.582.5)
valve volt: 12	+ 7th speed 1/min: 850
3rd speed 1/min: 1250	+ Charge press. hPa: 1000
ord speed Militi: 1200	T charge press. That too
Charge press. hPa: 1000	+ KSB solenoid-operated
Supply-pump	+ valve volt: 12
pressure bar: 6.06.6	+ Del.quantity cm3/: 83.084.0
pressure bar. 0.00.0	T Decidualities alian. 60.064.0
	40000 (00 5 0/ 5)
	+ 1000H.: (80.586.5)
Overflow quantity at overflow valve:	1000H.: (80.586.5) 4 8th speed 1/min: 500
Overflow quantity at overflow valve:	1000H.: (80.586.5) + 8th speed 1/min: 500 Charge press hPa: 1000
	1000H.: (80.586.5) + 8th speed 1/min: 500 + Charge press. hPa: 1000
1st speed 1/min: 500	1000H.: (80.586.5)  8th speed 1/min: 500  Charge press. hPa: 1000  KSB solenoid-operated
1st speed 1/min: 500	1000H.: (80.586.5)  8th speed 1/min: 500  Charge press. hPa: 1000  KSB solenoid-operated  valve volt: 12
1st speed 1/min: 500 Charge press. hPa: -	1000H.: (80.586.5)  8th speed 1/min: 500  Charge press. hPa: 1000  KSB solenoid-operated  valve volt: 12
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated	+ Det.quantity (1157: 55.054.0
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12	+ Det.quantity Clis7: 33.034.0 + 1000H: (49.557.5)
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow : 4183	+ Det.quantity (1157: 55.054.0
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow : 4183	+ 9th speed 1/min: 500
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698)	+ 1000H: (49.557.5) + 9th speed 1/min: 500 + Charge press. hPa: -
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250	+ Det.quantity CMS7: 33.034.0 + 1000H: (49.557.5) + 9th speed 1/min: 500 + Charge press. hPa: - + KSB solenoid-operated
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000	the decidentity cms/: 33.034.0  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000	the decidentity cms/: 33.034.0  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated	the decidentity cm3/: 33.034.0  1000H: (49.557.5)
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12	the decidentity cms/: 33.034.0  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)  1000H: (49.557.5)
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138	1000H: (49.557.5)  9th speed 1/min: 500  Charge press. hPa: -  KSB solenoid-operated  valve volt: 12  Del.quantity cm3/: 94.0104.0  1000H: -
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138	the decidentity cm3/: 33.034.0  1000H: (49.557.5)
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12	1000H: (49.557.5)  9th speed 1/min: 500  Charge press. hPa: -  KSB solenoid-operated  valve volt: 12  Del.quantity cm3/: 94.0104.0  1000H: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow : 55138 quantity cm3/10s: (40153)	1000H: (49.557.5)  9th speed 1/min: 500  Charge press. hPa: -  KSB solenoid-operated  valve volt: 12  Del.quantity cm3/: 94.0104.0  1000H: -  Zero delivery (stop):
1st speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138	1000H: (49.557.5)  9th speed 1/min: 500  Charge press. hPa: -  KSB solenoid-operated  valve volt: 12  Del.quantity cm3/: 94.0104.0  1000H: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow : 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.:	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow : 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char.:	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery—quant. and breakaway char.: 1st speed 1/min: 700*	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery—quant. and breakaway char:: 1st speed 1/min: 700* Charge—air pressure—setting	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid—operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery—quant. and breakaway char:: 1st speed 1/min: 700* Charge—air pressure—setting point hPa: 535	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery—quant. and breakaway char:: 1st speed 1/min: 700* Charge—air pressure—setting	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery—quant. and breakaway char::  1st speed 1/min: 700* Charge—air pressure—setting point hPa: 535 KSB solenoid—operated	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery—quant. and breakaway char::  1st speed 1/min: 700* Charge—air pressure—setting point hPa: 535 KSB solenoid—operated valve volt: 12	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid—operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow : 55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 700* Charge—air pressure—setting point hPa: 535 KSB solenoid—operated valve volt: 12 Del.quantity cm3/: 71.572.5	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow : 55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 700* Charge—air pressure—setting point hPa: 535 KSB solenoid—operated valve volt: 12 Del.quantity cm3/: 71.572.5	The speed 1/min: 500 (49.557.5)  9th speed 1/min: 500 (29.557.5)  Charge press. hPa: —  KSB solenoid—operated valve volt: 12 (20104.0)  Del.quantity cm3/: 94.0104.0 (1000H: —  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 (203)  Del.quantity cm3/: 03 (1000H.: —  Electr. shutoff:  Speed 1/min: 375
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid—operated valve volt: 12 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid—operated valve volt: 12 Overflow : 55138 quantity cm3/10s: (40153)  Delivery—quant. and breakaway char::  1st speed 1/min: 700* Charge—air pressure—setting point hPa: 535 KSB solenoid—operated valve volt: 12 Del.quantity cm3/: 71.572.5	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:  Speed 1/min: 375 ELAB volt: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char::  1st speed 1/min: 700* Charge-air pressure-setting point hPa: 535 KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 71.572.5 1000H.: (68.076.0) 2nd speed 1/min: 1450	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:  Speed 1/min: 375 ELAB volt: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char::  1st speed 1/min: 700* Charge-air pressure-setting point hPa: 535 KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 71.572.5 1000H.: (68.076.0) 2nd speed 1/min: 1450 Charge press. hPa: 1000	The speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:  Speed 1/min: 375 ELAB volt: - Del.quantity cm3/: 0.03.0
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char::  1st speed 1/min: 700* Charge-air pressure-setting point hPa: 535 KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 71.572.5 1000H.: (68.076.0) 2nd speed 1/min: 1450 Charge press. hPa: 1000 KSB solenoid-operated	1000H: (49.557.5)  9th speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:  Speed 1/min: 375 ELAB volt: -
1st speed 1/min: 500 Charge press. hPa: — KSB solenoid-operated valve volt: 12 Oveflow: 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 1250 Charge press. hPa: 1000 KSB solenoid-operated valve volt: 12 Overflow: 55138 quantity cm3/10s: (40153) Delivery-quant. and breakaway char::  1st speed 1/min: 700* Charge-air pressure-setting point hPa: 535 KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 71.572.5 1000H.: (68.076.0) 2nd speed 1/min: 1450 Charge press. hPa: 1000	The speed 1/min: 500 Charge press. hPa: - KSB solenoid-operated valve volt: 12 Del.quantity cm3/: 94.0104.0 1000H: -  Zero delivery (stop):  Mech. shutoff:  Speed 1/min: 1250 Del.quantity cm3/: 03 1000H.: -  Electr. shutoff:  Speed 1/min: 375 ELAB volt: - Del.quantity cm3/: 0.03.0

#### Idle delivery:

1st speed 1/min: 375 KSB solenoid-operated valve volt: 12

Del.quantity cm3/: 10.0..12.0 1000H.: (6.0...16.0)

2nd speed 1/min: 450 KSB solenoid-operated valve volt: 12

Del.quantity cm3/: 0.0...2.0

1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 100 Charge press. hPa: -KSB solenoid-operated valve volt: 12 Del.quantity cm3/: ind. 1000H: 80.0

2nd speed 1/min: 130 Charge press. hPa: -KSB solenoid-operated valve volt: 12 Del.quantity cm3/: max. 1000H: 80.0

#### Shutoff electromagnet:

Cut-in

min. voltage : 10.0 Rated voltage : 12.0

#### Mounting and assembly dimensions:

Designation

K mm : 3.6...3.8 KF mm : K-OT MS mm : 0.8...1.2 SVS max. mm : 2.1

Remarks:

: c.b.c. # 391 7535

Operate control lever after each manifold pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CAS 3,9 N : 07.11.89 Test sheet Edition

replaces

Calibrating oil : ISO 4113

: VE 4 12F1100 R370 Injection pump

: 0 460 424 056 Type number

Customer specific information

Customer : CASE

: 4 BT Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. , C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Start of delivery

mm : 0,3Prestroke

(from BDC): +0.02(0.04)

Start of delivery block mm: 1,55 Piston stroke

mm: +0,02(0,06)

**Outlet** : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750

Setting value mm: 3,2...3,6

Supply-pump pressure:

1/min: 750 Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

1/min: 750 Speed

Del.quantity cm3/

1000H.: 85,5...86,5 cm3/: 4,0

Dispersion

1000H.: (4,5)

Low-idle speed regulation:

1/min: 450 Speed

Del.quantity cm3/ 1000H.: 10,0...16,0 Dispersion cm3/: 5,5 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1160

Del.quantity cm3/ 1000H: 44,5...50,5

Start:

1/min: 100 Speed Del.quantity

mind cm3/1000H.: 60,0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 500 1st speed

mm: 1,7...2,5 mm: (1,4...2,8) TD travel

1/min: 750 2nd speed

mm: 3,2...3,6 mm: (2,7...4,1) 1/min: 1100 TD travel

3rd speed

mm: 4,7...5,5 mm: (4,4...5,8) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 3,3...3,9 1/min: 750 pressure

2nd speed Supply-pump

bar: 4,3...4,9 1/min: 1100 pressure

3rd speed

Automatic starting fuel delivery: Supply-pump bar: 5,9...6,5 pressure 1st speed 1/min: 250 Del.quantity cm3/: -Overflow quantity at overflow valve: 1000H: 80,0 ind. 1st speed 1/min: 500 : 41...83 1/min: 400 Oveflow 2nd speed Del.quantity cm3/: -max. 1000H: 120,0 quantity cm3/10s: (26...98) 1/min: 1100 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Shutoff electromagnet: Delivery-quant. and breakaway char .: Cut-in : 10,0 min. voltage : 12,0 1/min: 1200 Rated voltage 1st speed Del.quantity cm3/: 0,0...3,0 1000H.: -Mounting and assembly dimensions: 1/min: 1180 cm3/: 15,0...55,0 2nd speed Del.quantity cm3/: 1 1000H.: -Designation K mm : 5,0...5,4 : 0,8...1,2 KF 1/min: 1160 mm 3rd speed Del.quantity cm3/: 44,J...53,5) MS mm : 1,1 SVS max. mm : 18,8...20,8 4th speed 1/min: 1100 XΚ mm Del.quantity cm3/: 68,0...71,0 1000H.: (66,5...72,5) 5th speed 1/min: 900 XL : 11,0...14,4 mm Remarks: Del.quantity cm3/: 74,5...79,5 10004.: (73,0...81,0) 6th speed 1/min: 750 Del.quantity cm3/: 85,5...69,0)
7+h speed 1/min: 500 Del.quantity cm3/: 85,0...93,0 1000H.: -Zero delivery (stop): Mech. shutoff: 1/min: 1100 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 450 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: max. Idle delivery: 1st speed 1/min: 450 Del.quantity cm3/: 10,0..16,0 1000H.: (8,0...18,0) 2nd speed 1/min: 480 Del.quantity cm3/: 0,0...4,0 1000H.: -

Note inst. in remarks column

: CUM 3.9 N20 Test sheet Edition : 24.10.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R378 Type number : 0 460 424 058

Customer-specific information

: CDC Customer

: 4 BT - 3.9 IND.Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. , C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

**Openina** 

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.8

mm: +-0.02(0.06)

Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900 Speed

Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900 Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

1/min: 900 Speed

Del.quantity cm3/

1000H.: 67.0...68.0

cm3/: 4.0Dispersion

1000H.: (4.5)

Low-idle speed regulation:

1/min: 375 Speed

Deliquantity cm3/

1000H.: 8.0...14.0 cm3/: 5.5

Dispersion 1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1190

Del.quantity cm3/ 1000H: 47.0...53.0

Start:

Speed 1/min: 100 Del.quantity

cm3/1000H.: 70.0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 750 1st speed

TD travel mm: 0.8...1.6 mm: (0.5...1.9)

1/min: 900 2nd speed

TD travel

mm: 2.0...2.4 mm: (1.5...2.9)

1/min: 1150 3rd speed

TD travel mm: 3.2...4.0

mm: (2.9...4.3)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2.5...3.1 pressure

bar: (2.3...3.3)

1/min: 900 2nd speed

Supply-pump

bar: 4.2...4.8 pressure

bar: (4.0...5.0)

1/min: 1150 3rd speed Supply-pump bar: 5.2...5.8 pressure bar: (5.0...6.0) Overflow quantity at overflow valve: 1/min: 500 1st speed Oveflow : 41...83 cm3/10s: (26...98) quantity 1/min: 1150 2nd speed 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1300 1st speed cm3/: 0.0...3.0 Del.quantity 1000H.: (0.0...3.0) 1/min: 1220 2nd speed cm3/: 15.0...55.0 Del.quantity 1000H.: (15.0...55.0) 3rd speed 1/min: 1190 cm3/: 47.0...53.0 Del.quantity 1000H.: (44.0...56.0) 1/min: 1150 4th speed Del.quantity cm3/: 63.5...66.5 1000H.: (62.0....68.0) 1/min: 900 5th speed Del.quantity cm3/: 6/.u...o... 1000H.: (64.5...70.5) 1/min: 750 6th speed cm3/: 69.5...73.5 Del.quantity 1000H.: (67.5...77.5) 1/min: 500 7th speed Del.quantity cm3/: 68.0...76.0 1000H.: (66.0...78.0) Zero delivery (stop): Mech. shutoff: Speed 1/min: 1150 Del.quantity cm3/: 0..3 1000H .: -Electr. shutoff: Speed 1/min: 375 volt: -ELAS. Del.quantity cm3/: 0.0...3.0 1000H .: max. Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 8.0...14.0 1000H.: (6.0...16.0)

1/min: 500

Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) Automatic starting fuel delivery:

1st speed 1/min: 130 Del.quantity cm3/: - 1000H: 80.0

2nd speed 1/min: 240 Del.quantity cm3/: - max. 1000H: 80.0

Mounting and assembly dimensions:

Designation K mm : KF mm : 5.0...5.4
MS mm : 1.1...1.5
SVS max. mm : 4.0

Remarks: : C.D.C. # 391 7507

2nd speed

Note inst. in remarks column

: CUM 3.9 N21 Test sheet Edition : 24.10.89

replaces

: ISO 4113 Calibrating oil

: VE 4/12F1250 R378-2 Injection pump

Type number : 0 460 424 060

Customer-specific information

Customer : CDC

: 4 BT - 3.9 IND.Engine

k: 73 Power 1/mi: 2500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. , C .

with thermometer: 40...48

electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

**Opening** 

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm : 840 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +0.02(0.04)

Start of delivery block

mm: 1.8 Piston stroke

mm: +-0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900 mm: 2.0...2.4 Speed Setting value

Supply-pump pressure:

1/min: 900 Setting value bar: 4.6...5.2

Full-load del. w/out charge press.:

1/min: 1100 Speed

Del.quantity cm3/ 1000H.: 68.5...69.5

cm3/: 4.0 Dispersion

1000H.: (4.5)

Low-idle speed regulation:

1/min: 335 Speed

Del.quantity cm3/

1000H.: 8.0...14.0

cm3/: 5.0Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1290 Speed

Del.quantity cm3/

1000H: 58.0...64.0

Start:

1/min: 100 Speed Del.quantity

cm3/1000H.: 70.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing device characteristic:

1/min: 750 1st speed

mm: 0.8...1.6 mm: (0.5...1.9) TD travel

1/min: 900 2nd speed

TD travel mm: 2.0...2.4

mm: (1.5...2.9) 1/min: 1100

3rd speed

mm: 2.9...3.7 mm: (2.6...4.0) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

pressure

bar: 2.7...3.3 bar: (2.5...3.5) 1/min: 750

2nd speed

Supply-pump bar: 3.9...4.5 bar: (3.7...4.7) pressure 1/min: 900 3rd speed Supply-pump bar: 4.6...5.2 pressure bar: (4.4...5.4) 1/min: 1100 4th speed Supply-pump pressure bar: 5.4...6.0 bar: (5.2...6.2) Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Oveflow cm3/10s: (26...98) duantity 1/min: 1250 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char .: 1st speed 1/min: 1450 Del.quantity cm3/: 0.0...3.0 1000H.: (0.0...3.0)
2nd speed 1/min: 1360
Del.quantity cm3/: 15.0...55.0
1000H.: (15.0...55.0) 1/min: 1290 3rd speed Del.quantity cm3/: 58.0...64.0 1000H.: (55.0...67.0) 4th speed 1/min: 1250 Del.quantity cm3/: 00.3....71.0) 1/min: 1100 5th speed Del.quantity cm3/: 68.5...69.5 1000H.: (66.0...72.0) 6th speed 1/min: 750 Del.quantity cm3/: 73.0...77.0 1000H.: (71.0...79.0) 7th speed 1/min: 500
Del.quantity cm3/: 74.0...82.0
1000H.: (72.0...84.0) Zero delivery (stop): Mech. shutoff: 1/min: 1250 Speed Del.quantity cm3/: 0..3 1000H .: -Electr. shutoff: 1/min: 335 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -

Idle delivery: 1st speed 1/min: 335 Del.quantity cm3/: 8.0...14.0 1000H.: (6.0...16.0) 1/min: 500 2nd speed Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: -1000H: 75.0

1/min: 300 2nd speed Del.quantity cm3/: -max. 1000H: 80.0

Shutoff electromagnet:

Cut-in : 10.0 min. voltage Rated voltage : 12.0

Mounting and assembly dimensions:

Designation K

ind.

: 5.0...5.4 KF MYN MS mm : 0.8...1.2 SVS max. TIVE

Remarks:

: C.D.C. # 391 7510

Note inst. in remarks column

: CUM 3.9 N22 Test sheet Edition : 24.10.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R378-3

: 0 460 424 061 Type number

Customer-specific information

Customer : CDC

Engine : 4 BT - 390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48

electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina

bar: 250...253 pressure

Perforated-plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm : 840 x Length

Start of delivery

mm: 0.3 Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.8

mm: +0.02(0.06)

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900 Setting value mm: 2.3...2.7

Supply-pump pressure:

1/min: 900 Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

1/min: 900 Speed

Del.quantity cm3/ 1000H.: 69.0...70.0

cm3/: 4.0Dispersion

1000H.: (4.5)

Low-idle speed regulation:

1/min: 375

Del.quantity cm3/ 1000H.: 10.0...11.0 Dispersion cm3/: 5.5 1000H.: (7.0)

Full-load speed regulation:

1/min: 1110 Speed

Del.quantity cm3/ 1000H: 49.0...55.0

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 70.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

TD travel mm: 1.3...2.1 mm: (1.0...2.4)

1/min: 900 2nd speed

TD travel mm: 2.3...2.7 mm: (1.8...3.2)

3rd speed

1/min: 1050 mm: 2.8...3.6 mm: (2.5...3.9) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: (2.1...3.1) pressure

1/min: 900 2nd speed

Supply-pump

bar: 4.1...4.7 pressure

bar: (3.9...4.9)

1/min: 1050 3rd speed

Supply-pump bar: 4.8...5.4 Automatic starting fuel delivery: pressure bar: (4.6...5.6) 1/min: 130 1st speed Overflow quantity at overflow valve: Del.quantity cm3/: ind. 1000H: 80.0 1/min: 500 1st speed 1/min: 240 Oveflow : 41...83 2nd speed cm3/10s: (26...98) Del.quantity cm3/: quantity 1000H: 80.0 1/min: 1050 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Shutoff electromagnet: Delivery-quant. and breakaway char.: Cut-in : 10.0 min. voltage Rated voltage : 12.0 1st speed 1/min: 1200 Del.quantity cm3/: 0.0...3.0 1000H.: (0.0...3.0) Mounting and assembly dimensions: 2nd speed 1/min: 1140 Del.quantity cm3/: 15.0...55.0 1000H.: (15.0...55.0) Designation K mm 3rd speed 1/min: 1110 KF : 5.0...5.4 mm Del.quantity cm3/: 49.0...58.0) : 1.1...1.5 MS mm SVS max. mm 1/min: 1050 4th speed Del.quantity cm3/: 66.0...69.0 1000H.: (64.5...70.5) Remarks: : c.b.c. # 391 7035 5th speed 1/min: 900 Del.quantity cm3/: 09.0....2.5) 1/min: 750 6th speed Del.quantity cm3/: 72.0...76.0 1000H.: (70.0...78.0) 1/min: 500 7th speed Del.quantity cm3/: 72.0...80.0 1000H.: (70.0...82.0) Zero delivery (stop): Mech. shutoff: 1/min: 1050 Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 10...12 1000H.: (6.0...16.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0)

Note inst. in remarks column

: CUM 3.9 N23 Test sheet : 25.10.89 Edition

replaces

: ISO 4113 Calibrating oil

: VE 4/12F1100 R378-4 Injection pump

: 0 460 424 062 Type number

Customer-specific information

Customer : CDC

Engine : 4 BT - 3.9 TND.

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ... C .

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

mm : 0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm: 0.3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1.8

mm: +0.02(0.06)

Outlet : A

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900 Setting value mm: 2.3...2.7 Supply-pump pressure:

1/min: 900 Speed Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

1/min: 900 Speed

Del.quantity cm3/ 1000H.: 67.5...68.5

cm3/: 4.0 Dispersion

1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 335

Del.quantity cm3/ 1000H.: 8.0...14.0

cm3/: 5.5 Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1150 Speed

Del.quantity cm3/

1000H: 53.0...59.0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 70.0 mind `

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 750 1st speed

mm: 1.3...2.1 TD travel mm: (1.0...2.4)

1/min: 900 2nd speed

TD travel mm: 2.3...2.7

mm: (1.8...3.2)

1/min: 1100 3rd speed

mm: 3.1...3.9 mm: (2.8...4.2) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2.3...2.9 bar: (2.1...3.1) pressure

1/min: 900 2nd speed

Supply-pump

bar: 4.1...4.7 pressure

bar: (3.9...4.9)

3rd speed 1/min: 1100 Supply-pump bar: 4.9...5.5 bar: (4.7...5.7) pressure Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Oveflow cm3/10s: (26...98) quantity 1/min: 1100 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1250 1st speed Deliquantity cm3/: 0.0...3.0 1000H.: (0.0...3.0) 1/min: 1180 2nd speed Del.quantity cm3/: 15.0...55.0 1000H.: (15.0...55.0) 3rd speed 1/min: 1150 Del.quantity cm3/: 53.0...59.0 1000H.: (50.0...56.0) 1/min: 1100 4th speed 1/min: 900 5th speed Del.quantity cm3/: 67.5...68.5 1000H.: (65.0...71.0) 1/min: 750 6th speed 1/min: 500 7th speed Del.quantity cm3/: 69.0...77.0 1000H.: (67.0...79.0) Zero delivery (stop): Mech. shutoff: 1/min: 1100 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 335 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 1000H.: -Idle delivery: 1st speed 1/min: 335 Del.quantity cm3/: 8.0...14.0 1000H.: (6.0...16.0)

1/min: 500

Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: -1000H: 80.0 ind. 1/min: 240 2nd speed Del.quantity cm3/: - max. 1000H: 80.0 Shutoff electromagnet: Cut-in : 10.0 min. voltage Rated voltage : 12.0 Mounting and assembly dimensions: Designation TIME. 5.0...5.4 1.1...1.5 KF mm MS ΠVIII SVS max. mm : 3.2Remarks: : C.D.C. # 391 6929

2nd speed

Note inst. in remarks column

: CUM 5,9 P1 Test sheet : 02.11.89 : 16.10.86 Edition replaces : ISO 4113 Calibrating oil

: VE 6/12F1250 R159-16 Injection pump

: 0 460 426 066 Type number

Customer-specific information

Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating oil return temp. "C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm : 0,3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1,3

mm: +0,02(0,06)

: D Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750

Setting value mm: 3,4...3,8

Supply-pump pressure:

1/min: 750 Speed Setting value bar: 3,3...4,3

Full-load del. with charge press.:

1/min: 1100 Speed

Del.quantity cm3/ 1000H.: 73,0...74,0

cm3/:4,0Dispersion

1000H: (4,5)

Low-idle speed regulation:

1/min: 360 Speed Del.quantity cm3/ 1000H.: 7,0...15,0

cm3/: 5,5 Dispersion 1000H.: (7,0)

Full-load speed regulation:

1/min: 1300

Del.quantity cm3/

1000H: 51,00...57,0

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 60,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500

mm: 1,5...2,3 mm: (1,2...2,6) TD travel

1/min: 750 2nd speed

mm: 3,4...3,8 mm: (2,9...4,3) TD travel

1/min: 1100 3rd speed

mm: 5,2...6,0 mm: (4,9...6,3) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2,2...3,2 1/min: 750 pressure

2nd speed

Supply-pump pressure

bar: 3,3...4,3 1/min: 1100

3rd speed

Supply-pump bar: 4,6...5,6 pressure Overflow quantity at overflow valve: 1/min: 500 1st speed Oveflow : 41...83 cm3/10s: (26...98) quantity 1/min: 1250 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1400 1st speed Del.quantity cm3/: 0,0...3,0 1000H.: -1/min: 1390 2nd speed Del.quantity cmo/. cm3/: 0,0...15,0 1/min: 1350 cm3/: 15,0...55,0 3rd speed Del.quantity cms/: 1 3rd speed 4th speed 1/min: 1300 Del.quantity cm3/: 51,0...57,0 1000H.: (48,0...60,0) 1/min: 1250 5th speed 6th speed 1/min: 1100 cm3/: 73,0...74,0 Del.quantity 1000H.: (70,5....76,5) 1/min: 900 7th speed Del.quantity cm3/: 74,5...78,5 1000H.: 8th speed 1/min: 750 Del.quantity cm3/: 76,0...80,0 1000H: (74,0...82,0) 1/min: 500 9th speed Del.quantity cm3/: 64,0...72,01000H: (62,0...74,0) Zero delivery (stop): Mech. shutoff: Speed 1/min: 1250 Del.quantity cm3/: - 1000H.: 0..3 Electr. shutoff: Speed 1/min: 360 ELAB volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 360 1st speed

H18

Del.quantity cm3/: 7,0...15,0 1000H.: (6,0...16,0) 2nd speed 1/min: 450 Del.quantity cm3/: 0,0...4,0 1000H.: -Automatic starting fuel delivery: 1/min: 130 1st speed Del.quantity cm3/: -1000H: 70,0 ind. 1/min: 240 2nd speed Del.quantity cm3/: -max. 1000H: 70,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation K mm 5,0...5,4 KF mm MS : 0,6...1,0mm SVS max. : 0,9 mm 18,8...20,8 XK mm XL : 11,8...15,2 mm Remarks: : C.D.C. # 390 8198

Note inst. in remarks column

: CUM 5,9 P3 Test sheet : 02.11.89 Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R159-16

Type number : 0 460 426 066 Customer Part-No. : 3 916 114

Customer-specific information

Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

**Opening** 

pressure bar: 250...253

Perforated plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 x Length mm: 840

Start of delivery

Prestroke mm : 0,3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke

mm: 1,3 mm: ±0,02(0,06)

**Outlet** 

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed

H19

Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750 Setting value bar: 3,3...4,3

Full-load del. with charge press.:

Speed 1/min: 1100

Del.quantity cm3/ 1000H.: 73,0...74,0

Dispersion cm3/:4,0

1000H : (4,5)

Low-idle speed regulation:

Speed 1/min: 360

Speed Del.quantity cm3/ 1000H.: 7,0...15,0 Dispersion cm3/: 5,5 1000H.: (7,0)

Full-load speed regulation:

1/min: 1300 Speed

Deliquantity cm3/

1000H: 51,00...57,0

Start:

1/min: 100 Speed Del.quantity

mind cm3/1000H.: 60,0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500

mm: 1,5...2,3 mm: (1,2...2,6) TD travel

1/min: 750 2nd speed

mm: 3,4...3,8 mm: (2,9...4,3) 1/min: 1100 TD travel

3rd speed TD travel

mm: 5,2...6,0 mm: (4,9...6,3)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2,2...3,2 1/min: 750 pressure

2nd speed

Supply-pump

bar: 3,3...4,3 1/min: 1100 pressure

3rd speed

Del.quantity cm3/: 7,0...15,0 1000H.: (6,0...16,0) Supply-pump bar: 4,6...5,6 pressure 1/min: 450 2nd speed Del.quantity cm3/: 0,0...4,0 1000H.: -Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Automatic starting fuel delivery: **Oveflow** cm3/10s: (26...98) quantity 1/min: 1250 1/min: 130 2nd speed 1st speed : 55...138 Del.quantity cm3/: -Overflow cm3/10s: (40...153) 1000H: 70,0 ind. quantity Delivery-quant. and breakaway char.: 1/min: 240 2nd speed Del.quantity cm3/: -1/min: 1400 1000H: 70,0 1st speed cm3/: 0,0...3,0Del.quantity 1000H .: -Shutoff electromagnet: 1/min: 1390 2nd speed cm3/: 0,0...15,0 Del.quantity Cut-in 1000H.: min. voltage : 20,0 1/min: 1350 cm3/: 15,0...55,0 : 24,0 3rd specifically cms/. 1000H.: 3rd speed Rated voltage Mounting and assembly dimensions: 1/min: 1300 4th speed Del.quantity cm3/: 51,0...57,0Designation 1000H.: (48,0...60,0) K mm KF : 5,0...5,4 1/min: 1250 5th speed mm Del.quantity cm3/: 70,0...73,0 MS : 0,6...1,0 mm 1000H.: (68,5...74,5) 1/min: 1100 / cm3/: 73,0...74,0 SVS max. : 0,9 mm 18,8...20,8 6th speed XK mm : 11,8...15,2 XL Del.quantity mm 1000H.: (70,5....76,5) 1/min: 900 Remarks: 7th specific cms/...
1000H.: 7th speed cm3/: 74,5...78,5 1/min: 750 cm3/: 76,0...80,0 8th speed Del.quantity 1000H: (74,0...82,0) 1/min: 500 9th speed Del.quantity cm3/: 64,0...72,0 1000H: (62,0...74,0) Zero delivery (stop): Mech. shutoff: Speed 1/min: 1250 Del.quantity cm3/: -1000H.: 0..3 Electr. shutoff: 1/min: 360 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 1000H .: -Idle delivery: 1/min: 360 1st speed

H20

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : PER 6,0 C Test sheet Edition : 06.11.89 replaces : 03.02.89 : ISO 4113 Calibrating oil Injection pump : VE 6/12F1300 R240 Type number : 0 460 426 084 Customer-specific information Customer : PERKINS : T6 60 CC TRU Engine TEST BENCH REQUIREMENTS Calibrating-oil return temp. ., C . with thermometer : 40...48 electronically Inlet press., bar: 0.35 Calibrating nozzle-holder assembly : 1 688 901 020 Openina . pressure bar: 172...175 Perforated-plate diameter mm: 0.6 Test inj. tubing : 1 680 750 017 Outside diameter : 6 x Wall thickness : 2 mm : 840x Length Start of delivery mm: 0.25 Prestroke (from BDC): +-0.02(0.04)Start of delivery block Piston stroke mm: 1.0 mm: +-0.02Outlet : A Injection-pump setting values

Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100 Charge press. hPa: 1000

Setting value mm: 1.3...1.7 Supply-pump pressure: 1/min: 1100 Speed Charge press. hPa: 1000 Setting value bar: 6.5...7.1 Full-load del. with charge press.: 1/min: 700 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 99.0...100.0 cm3/:5.0Dispersion 1000H : -Full-load del. w/out charge press.: 1/min : 700 Speed Del.quantity cm3/ 1000H.: 87.0...88.0 Low-idle speed regulation: Speed 1/min: 300 Charge press. hPa: -Del.quantity cm3/ 1000H.: 16.5...20.5 cm3/: 5.0Dispersion 1000H .: -Full-load speed regulation: Speed 1/min: 1450 Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 47.0...53.0 Start: 1/min: 100 Speed Charge press. hPa: -Del.quantity mind cm3/1000H.: 120.0 Inspection pump test specifications Test specifications in parentheses Timing-device characteristic: 1st speed 1/min: 1000 Charge press. hPa: 1000 TD travel mm: 0.3...1.1 mm: (0.0...1.4)1/min: 1100 2nd speed Charge press. hPa: 1000 mm: 1.3...1.7 TD travel

mm: (0.8...2.2)

3rd speed 1/min: 1300 +	Charge press. hPa: 1000
Charge press. hPa: 1000	Del.quantity cm3/: 99.0100.0 1000H.: (96.5102.5)
TD travel mm: 2.02.8	
mm: (1.73.1)	8th speed 1/min: 700
<u> </u>	Charge press. hPa: -
Supply-pump pressure characteristic:	Del.quantity cm3/: 87.088.0
<b>†</b>	1000H: (84.590.5)
1st speed 1/min: 500	9th speed 1/min: 500
Charge press. hPa: 1000	Charge press. hPa: -
Supply-pump +	Del.quantity cm3/: 80.083.0
pressure bar: 3.94.5 2nd speed 1/min: 1100	1000H: (78.584.5)
2nd speed 1/min: 1100 +	
Charge press. hPa: 1000 +	Zero delivery (stop):
Supply-pump +	
pressure bar: 6.57.1	Mech. shutoff:
3rd speed 1/min: 1300 +	
Charge press. hPa: 1000	Speed 1/min: 1300
Supply-pump +	Del.quantity cm3/: 03
pressure bar: 7.37.9	1000H.: -
Overflow quantity at overflow valve:	Electr. shutoff:
1st speed 1/min: 500	Speed 1/min: 300
Charge press. hPa: -	ELAB volt: -
Oveflow : 4183 1	Del.quantity cm3/: 0.03.0
quantity cm3/10s: (2698)	max. 1000H.: -
2nd speed 1/min: 1300 +	
Charge press. hPa: 1000	Idle delivery:
Overflow : 55138 +	•
quantity cm3/10s: (40153)	1st speed 1/min: 300
+	Del.quantity cm3/: 16.520.5
Delivery quant. and breakaway char.:	1000H.: (13.523.5)
	2nd speed 1/min: 350
1st speed 1/min: 700 +	Del.quantity cm3/: 4.510.5
Charge-air pressure-setting +	1000H.: (2.512.5)
point hPa: 400	3rd speed 1/min: 400
LDA stroke mm: 6.3	Del.quantity cm3/: 0.02.6
Del.quantity cm3/: 95.096.0	1000H.: -
1000H.: (92.598.5)	
2nd speed 1/min: 1550	Automatic starting fuel delivery:
Charge press. hPa: 1000	, as a second of the second of
Del.quantity cm3/: 0.07.0	1st speed 1/min: 150
1000H.: - +	Charge press. hPa: -
3rd speed 1/min: 1500	Del.quantity cm3/: -
Charge press. hPa: 1000	ind. 1000H: 95.0
Del.quantity cm3/: 13.521.5	
1000H.: (10.524.5)	2nd speed 1/min: 230
4th speed 1/min: 1450	Charge press. hPa: -
Charge press. hPa: 1000	Del.quantity cm3/: -
Del.quantity cm3/: 47.053.0	max. 1000H : 85.0
1000H.: (44.056.0)	indicate to obtain the state of
5th speed 1/min: 1300	Shutoff electromagnet:
Charge press. hPa: 1000	Character of Coots offices
Del.quantity cm3/: 95.098.0	Cut-in
1000H.: (93.599.5)	min. voltage : 20.0
6th speed 1/min: 1000	Rated voltage : 24.0
Charge press. hPa: 1000	Haroa foctage . ETIO
Del.quantity cm3/: 99.5102.5	Mounting and assembly dimensions:
1000H.: (98.0104.0)	That they and absolutely afficely to 15.
7th speed 1/min: 700	Designation
i di opeda i i ii i i de	

K mm : KF mm : K-OT
MS mm : 0.6...1.0
SVS max. mm : 3.2
XK mm : 17.0...19.0
XL mm : 12.8...16.2

Remarks:

Note inst. in remarks column

: PER 6.0 C2 Test sheet

Compl. date:

: 06.11.89 **Fdition** : 03.02.89 replaces : ISO 4113 Calibrating oil

: VE 6/12F1300 R240-2 Injection pump

Type number : 0 460 426 094

Customer-specific information Customer : PERKINS

Engine : T6 60 CC TRU

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening

bar: 172...175 pressure

Perforated-plate

mm: 0.6 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2

x Length mm: 840

Start of delivery

Prestroke mm: 0.25

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1.0 mm: +-0.02

Outlet.

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1100 Speed

Charge press. hPa: 1000 Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value bar: 6.5...7.1

Full-load del. with charge press.:

Speed 1/min: 700 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 99.0...100.0

cm3/:5.0Dispersion

1000H: -

Full-load del. w/out charge press.:

Speed  $1/\min : 700$ Del.quantity cm3/

1000H .: 87.0...88.0

Low-idle speed regulation:

1/min: 300 Speed Charge press. hPa: -Del.quantity cm3/

1000H.: 16.5...20.5

cm3/: 5.0 Dispersion

1000H.: -

Full-load speed regulation:

1/min: 1450 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 47.0...53.0

Start:

Speed 1/min: 100 Charge press. hPa: -Del.quantity cm3/1000H.: 120.0 mind '

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed Charge press. hPa: 1000

mm: 0.4...1.2 TD travel mm: (0.1...1.5)

2nd speed 1/min: 1100 Charge press. hPa: 1000

H24

TD travel mm: 1.31.7	+	Del.quantity cm3/: 99.5102.5 1000H.: (98.0104.0)
mn: (0.82.2)	†	7th annual 4/min 200
3rd speed 1/min: 1300	†	7th speed 1/min: 700
Charge press. hPa: 1000	†	Charge press. hPa: 1000
TD travel mm: 2.02.8	+	Del.quantity cm3/: 99.0100.0
mm: (1.73.1)	+	1000H.: (96.5102.5)
	+	8th speed 1/min: 700
Supply-pump pressure characteristic:	+	Charge press. hPa: -
supply party probbite that dotter for it.	1	Del.quantity cm3/: 87.088.0
1st speed 1/min: 500	1	1000H: (84.590.5)
Change proces has 1000	T	9th speed 1/min: 500
Charge press. hPa: 1000	T	
Supply-pump	+	Charge press. hPa: -
pressure bar: 3.94.5	+	Del.quantity cm3/: 80.083.0
2nd speed 1/min: 1100	+	1000H: (78.584.5)
Charge press. hPa: 1000	+	
Supply-pump	+	Zero delivery (stop):
pressure bar: 6.57.1	+	·
3rd speed 1/min: 1300	1	Mech. shutoff:
Charge press. hPa: 1000	$\perp$	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Supply-pump	1	Speed 1/min: 1300
	Ŧ	Dol grantity on 7/1 0 7
pressure bar: 7.37.9	T	Del.quantity cm3/: 03 1000H.: -
	+	1000h.: =
Overflow quantity at overflow valve:	+	
	+	Idle delivery:
1st speed 1/min: 500	+	
Charge press. hPa: -	+	1st speed 1/min: 300
Oveflow : 4183	+	Del.quantity cm3/: 16.520.5
quantity cm3/10s: (2698)	+	Del.quantity cm3/: 16.520.5 1000H.: (13.523.5)
2nd speed 1/min: 1300	1	2nd speed 1/min: 350
Charge press. hPa: 1000	$\perp$	Del.quantity cm3/: 4.510.5
Overflow : 55138	T	1000H.: (2.512.5)
	T	
quantity cm3/10s: (40153)	Ť	3rd speed 1/min: 400
	†	Del.quantity_cm3/: 0.02.6
Delivery-quant. and breakaway char.:	+	1000H.: -
	+	
1st speed 1/min: 700	+	Automatic starting fuel delivery:
Charge-air pressure-setting	+	<del>"</del>
point hPa: 400	+	1st speed 1/min: 150
LDA stroke mm: 6.3	1	Charge press. hPa: -
Del quantity cm3/: 95 0 96 0	1	Del.quantity cm3/: -
Del.quantity cm3/: 95.096.0 1000H.: (92.598.5)	i i	ind. 1000H: 95.0
2nd speed 1/min: 1550	Ι	1110.
Charge phase has 1000	T	2nd annot 1/min 230
Charge press. hPa: 1000	T	2nd speed 1/min: 230
Del.quantity_cm3/: 0.07.0	<b>†</b>	Charge press. hPa: -
1000н.: -	†	Del.quantity_cm3/: -
3rd speed 1/min: 1500	†	max. 1000H : 85.0
Charge press. hPa: 1000	+	
Del.quantity cm3/: 13.521.5	+	Shutoff electromagnet:
1000H.: (10.524.5)	+	_
4th speed 1/min: 1450	+	Cut-in
Charge press. hPa: 1000	1	min. voltage : -
Del.quantity cm3/: 47.053.0	1	Rated voltage : -
1000H.: (44.056.0)	1	nacca voccage .
	T	Mounting and accombly dimensions:
5th speed 1/min: 1300	T	Mounting and assembly dimensions:
Charge press. hPa: 1000	†	B
Del.quantity cm3/: 95.098.0	+	Designation
1000H.: (93.599.5)	+	K mm:-
6th speed 1/min: 1000	+	KF mm : K-OT
Charge press. hPa: 1000	+	MS mm : 0.61.0
• • • • • • • • • • • • • • • • • • • •	+	SVS max. mm : -

XK mm : 17.0...19.0 XL mm : 12.8...16.2

Remarks:

Note inst. in remarks column

: MAN 7,2 T Test sheet Edition : 06.11.89

replaces

Calibrating oil : ISO 4113

: VE 6/12F1350 R291-2 Injection pump

Type number : 0 460 426 134

Customer-specific information

Customer : MAN

: D 0826 GF Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. \_, C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 020 assembly

**Opening** 

bar: 172...175 pressure

Perforated-plate

diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm: 0,35 Prestroke

(from BDC): +0.02(0.04)

Indicator setting: Piston stroke mm: 1.0 Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000 Charge press. hPa: -

Setting value mm: 3,1...3,5

Supply-pump pressure:

1/min: 1000 Speed Setting value bar: 5,9...6,5

Full-load del. with charge press.:

1/min: 1000 Speed

Del.quantity cm3/

1000H.: 97,5...98,5 cm3/: 4,0

Dispersion 1000H : (4,5)

Low-idle speed regulation:

1/min: 300 Speed

Del.quantity cm3/

1000H.: 19,0...25,0 cm3/: 3,5

Dispersion 1000H.: (4,0)

Full-load speed regulation:

1/min: 1400 Delaguantity cm3/

1000H: 73,0...79,0

Start:

1/min: 100 Speed Del.quantity mind ' cm3/1000H.: 70,0

Load-dependent start of delivery:

1/min: 1000 Speed

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 0,9...1,7 mm: (0,6...2,0) TD travel

1/min: 1000 2nd speed mm: 3,1...3,5 TD travel

mm: (2,6...4,0)1/min: 1100 3rd speed

mm: 4,0...4,8 mm: (3,7...5,1) TD travel

Supply-pump pressure characteristic:

1/min: 600 1st speed

Supply-pump

bar: 3,9...4,5 pressure

1/min: 1000 2nd speed

Supply-pump bar: 5,9...6,5 pressure 1/min: 1350 3rd speed Supply-pump bar: 7,5...8,1 pressure Overflow quantity at overflow valve: 1/min: 600 1st speed : 41...83 Oveflow quantity cm3/10s: (26...98) 1/min: 1350 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1550 1st speed cm3/: 0,0...3,0 Del.quantity 1000H.: -1/min: 1500 2nd speed cm3/: 0,0...20,0 Del.quantity 1000H.: 1/min: 1450 3rd speed cm3/: 20,0...60,0 Del.quantity 1000H.: 1/min: 1400 4th speed Del.quantity cm3/: 73,0...79,0 1000H.: (71,5...80,5) 1/min: 1350 5th speed Del.quantity cm3/: 93,5...96,5 1000H.: (92,0...98,0) 6th speed 1/min: 1000 cm3/: 97,5...98,5 Del.quantity 1000H.: (95,5...100,5) 7th speed 1/min: 800 Del.quantity cm3/: 96,0...100,0 1000H.: (94,5...101,5) 8th speed 1/min: 600 Del.quantity cm3/: 93,0...97,0 1000H: (91,5...98,5) Zero delivery (stop): Mech. shutoff: 1/min: 1350 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 300 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 1000H.: -Idle delivery: 1/min: 300 1st speed

Del.quantity cm3/: 19,0..25,0 1000H.: (17,0..27,0) 1/min: 450 2nd speed Del.quantity cm3/: 0,0...4,0 1000H.: -Automatic starting fuel delivery: 1/min: 250 1st speed Del.quantity cm3/: -1000H: 105,0 ind. 1/min: 400 2nd speed Del.quantity cm3/: -max. 1000H: 110,0 Shutoff electromagnet: Cut-in min. voltage Rated voltage : 24,0 Mounting and assembly dimensions: Designation K mm : 5,1...5,5 KF mm : 0,8...1,2 : 4,2 MS SVS max. : 17,0...19,0 XK mm

mm

: 11,9...15,3

Remarks:

XL

Note inst. in remarks column

: CUM 5.9 U35 : 23.10.89 Test sheet Edition : 10.07.89 replaces : ISO 4113 Calibrating oil

Injection pump : VE 6/12F1000 R369 : 0 460 426 138 Type number

Customer-specific information

Customer

: CDC

Engine

: 6 BT - 5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

**Opening** 

bar: 250...253 pressure

Perforated plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.5

mm: +-0.02(0.06)

**Outlet** : D

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed Setting value mm: 3.0...3.4 Supply-pump pressure:

1/min: 750 Speed Setting value bar: 3.3...3.9

Full-load del. w/out charge press.:

1/min: 850 Speed

Del.quantity cm3/ 1000H.: 63.0...64.0

cm3/: 4.0Dispersion 1000H .: (4.5)

Low-idle speed regulation:

1/min: 450 Speed Del.quantity cm3/

1000H.: 4.0...10.0 cm3/: 5.5 Dispersion 1000H.: (7.0)

Full-load speed regulation:

1/min: 1040 Speed

Del.quantity cm3/ 1000H: 53.0...59.0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 60.0

Inspection-pump test specifications Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 500

mm: 1.2...2.0 TD travel mm: (0.9...2.3)

1/min: 750 2nd speed

mm: 3.0...3.4 TD travel

mm: (2.5...3.9)

1/min: 1000 3rd speed

mm: 4.6...5.4 TD travel

mm: (4.3...5.7)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2.3...2.9 pressure bar: (2.1...3.1)

2nd speed 1/min: 750

Supply-pump

bar: 3.3...3.9 pressure

bar: (3.1...4.1)

Del.quantity cm3/: 4.0...10.0 1000H.: (2.0...12.0) 1/min: 1000 3rd speed Supply-pump 2nd speed 1/min: 500 Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) bar: 4.5...5.1 pressure bar: (4.3...5.3) Overflow quantity at overflow valve: Automatic starting fuel delivery: 1/min: 500 1st speed 1/min: 130 Oveflow : 41...83 1st speed quantity cm3/10s: (26...98) Del.quantity cm3/: -1000H: 70.0 1/min: 1000 ind. 2nd speed Overflow : 55...138 quantity cm3/10s: (40...153) 2nd speed 1/min: 240 Del.quantity cm3/: - max. 1000H: 35.0 Delivery-quant. and breakaway char.: 1/min: 1120 Shutoff electromagnet: 1st speed Del.quantity cm3/: 0.0...3.0 1000H.: (0.0...3.0) Cut-in 1/min: 1100 min. voltage : 20.0 2nd speed Del.quantity cm3/: 0.0...15.0 1000H.: (0.0...15.0) 3rd speed 1/min: 1060 Del.quantity cm3/: 25.0...55.0 1000H.: (25.0...55.0) Rated voltage : 24.0 Mounting and assembly dimensions: Designation 1/min: 1040 4th speed K mm Del.quantity cm3/: 53.0...59.0 1000H:: (50.0...62.0) 5th speed 1/min: 1000 KF : 5.0...5.4 mm : 0.8...1.2 MS m : 1.2 SVS max. mn Del.quantity cm3/: 60.0...63.0 1000H.: (58.5...64.5) : 18.8...20.8 XK mm : 9.9...13.3 XL mm 1/min: 850 6th speed Del.quantity cm3/: 63.0...66.53 7th speed 1/min: 750 Remarks: : C.D.C. # 391 7563 Del.quantity cm3/: 61.0...65.0 1000H.: (59.0...67.0) 1/min: 500 8th speed Del.quantity cm3/: 38.5...46.5 1000H: (36.5...48.5) Zero delivery (stop): Mech. shutoff: 1/min: 1000 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 450 Speed ELAB volt: -Del.quantity cm3/: 0.0...3.0 max. 1000H.: -Idle delivery: 1st speed 1/min: 450

Note inst. in remarks column

: CAS 5,9 G Test sheet : 07.11.89 Edition

replaces

: ISO 4113 Calibrating oil

: VE 6/12F1100 R371 Injection pump : 0 460 426 140 Type number

Customer-specific information

Customer : CASE

: 6 BT-5.9IND Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. , C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Openina

bar: 250...253 pressure

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mn : 0,2Prestroke

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1,5

mm: +0,02(0,06)

**Outlet** : D

Injection pump setting values Test specifications in parentheses

Timing device travel:

1/min: 750 Speed

Setting value mm: 2,6...3,0

Supply-pump pressure:

1/min: 750 Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

1/min : 750 Speed

Del.quantity cm3/

1000H.: 58,5...59,5 cm3/: 4,0

Dispersion 1000H.: (4,5)

Low-idle speed regulation:

1/min: 400 Speed

Del.quantity cm3/ 1000H.: 8,0...12,0 Dispersion cm3/: 5,5 1000H .: (7,0)

Full-load speed regulation:

Speed 1/min: 1160

Del.quantity cm3/

1000H: 41,0...47,0

Start:

Speed 1/min: 100

Del.quantity cm3/1000H.: 35,0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 500 1st speed

mm: 0,6...1,4 mm: (0,3...1,7) TD travel

1/min: 750 2nd speed

TD travel

mm: 2,6...3,0 mm: (2,1...3,5)

1/min: 1100 3rd speed TD travel

mm: 5,0...5,8 mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 3,8...3,4 1/min: 750 pressure

2nd speed

Supply-pump

bar: 4,9...5,5 pressure

1/min: 1100 3rd speed

Automatic starting fuel delivery: Supply-pump bar: 6,4...7,0 pressure 1st speed 1/min: 220 Overflow quantity at overflow valve: Del.quantity cm3/: -1000H: 45,0 ind. 1st speed 1/min: 500 : 41...83 1/min: 420 Oveflow 2nd speed Del.quantity cm3/: - max. 1000H: 70,0 cm3/10s: (26...98) quantity 2nd speed 1/min: 1100 : 55...138 Overflow quantity cm3/10s: (40...153) Shutoff electromagnet: Cut-in Delivery-quant. and breakaway char .: min. voltage Rated voltage 1/min: 1210 1st speed Del.quantity cm3/: 0,0...3,0 1000H.: -Mounting and assembly dimensions: 1/min: 1180 2nd speed Del.quantity cm3/: 15,0...55,0 1000H.: -Designation mm 1/min: 1160 cm3/: 41,0...47,0 KF 3rd speed mm Del.quantity MS mm 1000H.: (38,0...50,0) SVS max. mm 1/min: 1100 XK 4th speed Del.quantity cm3/: >>>....60,0) XL mm 5th speed 1/min: 900
Del.quantity cm3/: 57,5...60,5
1000H.: (56,0...62,0) Remarks: 1/min: 750 6th speed Del.quantity cm3/: >0/3....62/0) 1/min: 500 7th speed Del.quantity cm3/: 50,5...58,5 1000H.: -Zero delivery (stop): Mech. shutoff: Speed 1/min: 1100 Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 400 Speed volt: -EI AB Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 400 1st speed Del.quantity cm3/: 8,0...12,0 1000H.: (5,0...15,0) 1/min: 450 2nd speed Del.quantity cm3/: 0,0...4,0 1000H.: -

: 10,0

: 12,0

: 5,0...5,4 : 0,8...1,2

: 18,8...20,8 : 11,3...14,7

: 4,5

Note inst. in remarks column

Test sheet : CUM 5.9 W6 Edition : 20.10.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R373/1

: 0 460 426 144 Type number

Customer-specific information

Customer

: 6 BT - 5.9 IND. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. , C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

mm : 0.5diameter

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm:0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.85

mm: +-0.02(0.06)

Outlet. : D

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 1.6...2.0

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 3.3...3.9

Full-load del. with charge press.:

1/min: 750 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 82.5...84.5

cm3/:4.0Dispersion 1000H: (4.5)

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/

1000H.: 67.5...68.5

cm3/: 9.0Dispersion 1000H.: -

Low-idle speed regulation:

Speed 1/min: 375 Charge press. hPa: -

Del.quantity cm3/ 1000H.: 9.0...13.0 Dispersion cm3/: 5.5 1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1200 Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 64.0...70.0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity cm3/1000H.: 70.0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 600 1st speed Charge press. hPa: 1000

mm: 0.5...1.3 mm: (0.2...1.6) TD travel

1/min: 750 2nd speed Charge press. hPa: 1000

TD travel mm: 1.62.0	+	Charge press. hPa: 1000
mn: (1.12.5)	+	Del.quantity cm3/: 81.084.0
3rd speed 1/min: 1150	+	1UUUH.: (79.585.5)
Charge press. hPa: 1000	+	7th speed 1/min: 750
TD travel mm: 2.83.6	+	Charge press. hPa: 1000
mm: (2.53.9)	+	Del.quantity cm3/: 82.583.5
	+	1000H.: (80.086.0)
Supply-pump pressure characteristic:	+	8th speed 1/min: 500
	+	Charge press. hPa: 1000 Del.quantity cm3/: 82.090.0
1st speed 1/min: 500	+	Del.quantity cm3/: 82.090.0
Charge press. hPa: 1000	+	1000H: -
Supply-pump	+	9th speed 1/min: 5000
pressure bar: 2.63.2	1	Charge press. hPa: -
bar: (2.43.4)	1	Del.quantity cm3/: 67.568.5
2nd speed 1/min: 750	1	1000H: (63.572.5)
Charge press. hPa: 1000	1	
Supply-pump	1	Zero delivery (stop):
pressure bar: 3.33.9	1	2010 40017017 (000)
bar: (3.14.1)	1	Mech. shutoff:
3rd speed 1/min: 1150	1	ricella silacorra
Charge press. hPa: 1000		Speed 1/min: 1150
Supply-pump	I	Del.quantity cm3/: 03
	T	1000H.: -
pressure bar: 4.95.5 bar: (4.75.7)	Ι	1000:1.
Dar: (4.7).17	I	Electr. shutoff:
Conflor monthly at avantler values	T	Electi. Shutoff.
Overflow quantity at overflow valve:	T	Speed 1/min: 375
Antonia Almin. 500	T	
1st speed 1/min: 500	T	ELAB volt: -
Charge press. hPa: -	<b>T</b>	Del.quantity cm3/: 0.03.0
Oveflow : 4183	+	max. 1000H.: -
quantity cm3/10s: 2698	+	* II 4.1.9
2nd speed 1/min: 1150	+	Idle delivery:
Charge press. hPa: 1000	+	A
Overflow : 55138	+	1st speed 1/min: 375
quantity cm3/10s: 40153	+	Del.quantity cm3/: 9.013.0
	+	1000H.: (6.016.0) 2nd speed 1/min: 500
Delivery-quant. and breakaway char.:	+	2nd speed 1/min: 500
	+	Del.quantity cm3/: 0.04.0
1st speed 1/min: 700*	+	1000H.: (0.04.0)
Charge-air pressure-setting	+	
point hPa: 400	+	Automatic starting fuel delivery:
Del.quantity cm3/: 77.578.5	+	
1000H.: (73.582.5)	+	1st speed 1/min: 280
2nd speed 1/min: 1300	+	Charge press. hPa: -
Charge press. hPa: 1000	+	Del.quantity cm3/: -
Del.quantity cm3/: 0.03.0	+	ind. 1000H: 75.0
1000H.: (0.03.0)	+	
3rd speed 1/min: 1230	+	2nd speed 1/min: 440
Charge press. hPa: 1000	+	Charge press. hPa: -
Del.quantity cm3/: 15.055.0	+	Del.quantity cm3/: -
1000H.: (15.055.0)	1	max. 1000H : 80.0
4th speed 1/min: 1200	1	
Charge press. hPa: 1000	1	Shutoff electromagnet:
Del.quantity cm3/: 64.070.0	1	
1000H.: (61.073.0)	1	Cut-in
5th speed 1/min: 1150	1	min. voltage : 10.0
Charge press. hPa: 1000	1	Rated voltage : 12.0
Del.quantity cm3/: 76.079.0	$\mathbf{I}$	nucca foccage . 12.0
1000H.: (74.580.5)	Ι	Mounting and assembly dimensions:
6th speed 1/min: 900	Ι	reducting and assembly difficus (015).
NEU SUCCU (/1913), JULI	-	

Designation K KF m . 5.0...5.4 : 1.0...1.4 mn MS SVS max. mm nan

Remarks: : C.D.C. # 391 6894

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CUM 5.9 U36 Test sheet Edition : 23.10.89 : 10.07.89 replaces Calibrating oil : ISO 4113

: VE 6/12F1050 R373-2 Injection pump Type number : 0 460 426 145

Customer-specific information

Customer : CDC

: 6 BTA - 5.9 IND. Engine

k: 118 Power 1/mi: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. , C .

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

pressure bar: 250...253

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm : 0.3

(from BDC): +0.02(0.04)

Start of delivery block mm: 1.85 Piston stroke

mm: +-0.02(0.06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 1.5...1.9

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 2.9...3.5

Full-load del. with charge press.:

1/min: 750 Charge press. hPa: 1000 Del.quantity cm3/

1000H.: 94.5...95.5

cm3/: 4.0Dispersion 1000H: (4.5)

Full-load del. w/out charge press.:

Speed  $1/\min : 500$ 

Del.quantity cm3/ 1000H.: 50.5...51.5 Dispersion cm3/: 9.0

1000H.: -

Low-idle speed regulation:

1/min: 375 Speed Charge press. hPa: -

Del.quantity cm3/ 1000H.: 8.0...12.0

cm3/: 5.5 Dispersion 1000H .: (7.0)

Full-load speed regulation:

1/min: 1100 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 73.0...79.0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity : -mind cm3/1000H.: 60.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600 Charge press. hPa: 1000

TD travel mm: 0.51.4	+ Charge press. hPa: 1000
(0 2 4 4)	Dal grantity on 7/2 97 5 94 5
mm: (0.21.6)	Del.quantity cm3/: 83.586.5 1000H.: (82.088.0) 6th speed 1/min: 900
2nd speed 1/min: 750	+ 1000H.; (82.088.0)
Charge press. hPa: 1000	⊥ 6th speed 1/min 900
TD travel	+ Charge press. hPa: 1000
TD travel mm: 1.51.9	T clidige press. IIIa. 1000
(   U     - C   - T	+ Del.quantity cm3/: 87.590.5
3rd speed 1/min: 1050	1000H.: (86.092.0)
Change proce hPa: 1000	+ 7th speed 1/min: 750
Charge press. hPa: 1000	
TD travel mm: 2.53.4	+ Charge press. hPa: 1000
mm: (2.23.6)	+ Del.quantity cm3/: 94.595.5
min Caratteria	Del.quantity cm3/: 94.595.5 1000H.: (92.098.0)
Supply-pump pressure characteristic:	† 8th speed 1/min: 500
	+ Charge press. hPa: 1000
1st speed 1/min: 500	+ Del.quantity cm3/: 98.0106.0
Change page 4000	10000
Charge press. hPa: 1000	+ 1000H: -
Supply-pump	+ 9th speed 1/min: 500
pressure bar: 1.82.4	+ Charge press. hPa: -
ban (4 ( 2 ()	011 di ge press. 111 d.
bar: (1.62.6)	Del.quantity cm3/: 50.551.5
2nd speed 1/min: 750	十 1000H: (46.555.5)
Charge press. hPa: 1000	<b>↓</b>
	Jana daliyany (atan).
Supply-pump	† Zero delivery (stop):
pressure bar: 2.93.5	<u>†</u>
bar: (2.73.7)	# Mech. shutoff:
3rd speed 1/min: 1050	1
ord speed Militin, 1000	T 0 1 4/2/2 4000
Charge press. hPa: 1000	+ Speed 1/min: 1050
Supply-pump	+ Del.quantity cm3/: 03
pressure bar: 4.34.9	1000н.: -
	100011.
bar: (4.15.1)	T
	+ Electr. shutoff:
Overflow quantity at overflow valve:	+
over teem qualitate, at over teem variet	
· -	1 Speed 1/min, 375
	+ Speed 1/min: 375
1st speed 1/min: 500	+ ELAB volt: -
1st speed 1/min: 500 Charge press hPa: -	+ ELAB volt: -
Charge press. hPa: -	+ ELAB volt: - + Del.quantity cm3/: 0.03.0
Charge press. hPa: - Oveflow : 4183	+ ELAB volt: -
Charge press. hPa: - Oveflow: 4183 quantity cm3/10s: (2698)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -
Charge press. hPa: - Oveflow: 4183 quantity cm3/10s: (2698)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -
Charge press. hPa: -  Oveflow: 4183  quantity cm3/10s: (2698)  2nd speed: 1/min: 1050	+ ELAB volt: - + Del.quantity cm3/: 0.03.0
Charge press. hPa: -  Oveflow: 4183  quantity cm3/10s: (2698)  2nd speed: 1/min: 1050	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:
Charge press. hPa: -  Oveflow : 4183  quantity cm3/10s: (2698)  2nd speed 1/min: 1050  Charge press. hPa: 1000  Overflow : 55138	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375
Charge press. hPa: -  Oveflow : 4183  quantity cm3/10s: (2698)  2nd speed 1/min: 1050  Charge press. hPa: 1000  Overflow : 55138	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0
Charge press. hPa: -  Oveflow: 4183  quantity cm3/10s: (2698)  2nd speed: 1/min: 1050	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0
Charge press. hPa: - Oveflow : 4183   quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138   quantity cm3/10s: (40153)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)
Charge press. hPa: -  Oveflow : 4183  quantity cm3/10s: (2698)  2nd speed 1/min: 1050  Charge press. hPa: 1000  Overflow : 55138	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153) Delivery-quant. and breakaway char.:	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153) Delivery-quant. and breakaway char.:	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700*	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del. quantity cm3/: 79.580.5	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char::  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250
Charge press. hPa: - Oveflow : 4183   quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138   quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting   point hPa: 300 Del.quantity cm3/: 79.580.5   1000H.: (75.584.5) 2nd speed 1/min: 1200	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: -
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: -
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: -
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: -
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0 1000H.: (0.03.0)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0) 2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0) 3rd speed 1/min: 1140	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0) 3rd speed 1/min: 1140 Charge press. hPa: 1000	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: -
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0) 3rd speed 1/min: 1140 Charge press. hPa: 1000	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: -
Charge press. hPa: — Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5) 2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0) 3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: -
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0  1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: (15.055.0)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: -
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: (15.055.0) 4th speed 1/min: 1100	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: - max. 1000H: 55.0
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: (15.055.0) 4th speed 1/min: 1100	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: - max. 1000H: 55.0
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0     1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: (15.055.0) 4th speed 1/min: 1100	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: -
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0  1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0  1000H.: (15.055.0) 4th speed 1/min: 1100 Charge press. hPa: 1000 Del.quantity cm3/: 73.079.0	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: - max. 1000H: 55.0  Shutoff electromagnet:
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0  1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0 1000H.: (15.055.0) 4th speed 1/min: 1100 Charge press. hPa: 1000 Del.quantity cm3/: 73.079.0 1000H.: (70.082.0)	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: - max. 1000H: 55.0  Shutoff electromagnet:  Cut-in
Charge press. hPa: - Oveflow : 4183     quantity cm3/10s: (2698) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Overflow : 55138     quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:  1st speed 1/min: 700* Charge-air pressure-setting     point hPa: 300 Del.quantity cm3/: 79.580.5     1000H.: (75.584.5)  2nd speed 1/min: 1200 Charge press. hPa: 1000 Del.quantity cm3/: 0.03.0  1000H.: (0.03.0)  3rd speed 1/min: 1140 Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0  1000H.: (15.055.0) 4th speed 1/min: 1100 Charge press. hPa: 1000 Del.quantity cm3/: 73.079.0	ELAB volt: - Del.quantity cm3/: 0.03.0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 375 Del.quantity cm3/: 8.012.0 1000H.: (5.015.0)  2nd speed 1/min: 500 Del.quantity cm3/: 0.04.0 1000H.: (0.04.0)  Automatic starting fuel delivery:  1st speed 1/min: 250 Charge press. hPa: - Del.quantity cm3/: - ind. 1000H: 45.0  2nd speed 1/min: 450 Charge press. hPa: - Del.quantity cm3/: - max. 1000H: 55.0  Shutoff electromagnet:

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K KF mm mm : 5.0...5.4 mm : 1.2...1.6 mm : 1.2 MS SVS max.

Remarks:

: C.D.C. # 391 7000 Operate control lever after each manifold pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CUM 5.9 W4 Test sheet : 20.10.89 Edition

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1325 R367-1

Type number : 0 460 426 146

Customer-specific information

Customer : CDC

: 6 BT 5.9 IND. Engine

k: 97 Power 1/mi: 2650 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

pressure bar: 250...253

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block mm: 1.5 Piston stroke

mm: +-0.02(0.06)

: D Outlet

Injection pump setting values

Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850

Setting value mm: 3.9...4.3

Supply-pump pressure:

1/min: 850

Setting value bar: 3.9...4.5

Full-load del. w/out charge press.:

1/min: 1100 Speed

Del.quantity cm3/ 1000H.: 56.0...57.0

cm3/: 4.0 Dispersion

1000H.: (4.5)

Low-idle speed regulation:

1/min: 375

Del.quantity cm3/ 1000H.: 8.0...14.0

cm3/: 5.5 Dispersion 1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1400

Del.quantity cm3/

1000H: 36.0...42.0

Start:

1/min: 100 Speed

Del.quantity cm3/1000H.: 60.0 mind

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed

1/min: 500 mm: 1.3...2.1 mm: (1.0...2.4) TD travel

2nd speed 1/min: 850

TD travel

mm: 3.9...4.3 mm: (3.4...4.8)

1/min: 1100 3rd speed

TD travel

mm: 5.9...6.7 mm: (5.6...7.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

pressure

bar: 2.5...3.1 bar: (2.3...3.3)

1/min: 850 2nd speed

Supply-pump bar: 3.9...4.5 bar: (3.7...4.7) pressure 1/min: 1100 3rd speed Supply-pump bar: 4.9...5.5 bar: (4.7...5.7) pressure Overflow quantity at overflow valve: 1st speed 1/min: 500 Oveflow : 41...83 cm3/10s: (26...98) quantity 1/min: 1325 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1520 \_cm3/: 0.0...3.0 1st speed Del.quantity 1000H.: (0.0...3.0) 1/min: 1440 2nd speed Del.quantity cm3/: 15.0...45.0 1000H.: (15.0...45.0) 1/min: 1400 cm3/: 36.0...42.0 3rd speed Del.quantity 1000H.: (33.0...45.0) 1/min: 1325 4th speed Del.quantity cm3/: 52.5...55.5 1000H.: (51.0...57.0) 1/min: 1100 cm3/: 56.0...57.0 5th speed 6th speed Del.quantity cm3/: >3.3..... 1000H.: (51.5...59.5) 7th speed 1/min: 500
Del.quantity cm3/: 38.5...46.5
1000H.: (36.5...48.5) Zero delivery (stop): Mech. shutoff: 1/min: 1325 Speed Del.quantity cm3/: 0..3 1000H .: -Electr. shutoff: Speed 1/min: 375 volt: -Del.quantity cm3/: 0.0...3.0 1000H .: max. Idle delivery:

1/min: 375

Del.quantity cm3/: 8.0...14.0 1000H.: (6.0...16.0) 2nd speed 1/min: 450 Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: -1000H: 65.0 ind. 1/min: 250 2nd speed Del.quantity cm3/: -max. 1000H: 65.0 Shutoff electromagnet: Cut-in min. voltage Rated voltage : 24.0 Mounting and assembly dimensions: Designation mm : 5.0...5.4 : 1.3...1.7 KF mm MS mm SVS max. mm Remarks: : C.D.C. # 391 6904

1st speed

Note inst. in remarks column

: CUM 5.9 U45 Test sheet Edition : 23,10,89

replaces

Calibrating oil : ISO 4113

: VE 6/12F1250 R373/3 : 0 460 426 149 Injection pump

Type number

Customer-specific information

Customer : CDC

: 6 BTA - 590 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina

bar: 250...253 pressure

Perforated-plate

mm : 0.5diameter

Test ini. tubing : 1 688 901 027

Outside diameter x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm: 0.3 Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke

mm: 1.85

mm: +-0.02(0.06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Charge press. hPa: 1000 Setting value mm: 1.4...1.8

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 3.2...3.8

Full-load del. with charge press.:

1/min: 750 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H.: 82.0...83.0

cm3/:4.0Dispersion 1000H: (4.5)

Full-load del. w/out charge press.:

1/min: 500 Speed

Del.quantity cm3/

1000H.: 40.0...41.0

Low-idle speed regulation:

1/min: 375 Speed Charge press. hPa: -

Del.quantity cm3/ 1000H.: 4.0...8.0

cm3/: 5.5Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1300 Speed Charge press. hPa: 1000

Del.quantity cm3/

1000H: 65.0...71.0

Start:

1/min: 100 Speed Charge press. hPa: -Del.quantity : - mind cm3/1000H.: 70.0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 600 1st speed Charge press. hPa: 1000

mm: 0.4...1.2 mm: (0.1...1.5) TD travel

1/min: 750 2nd speed

Charge press. hPa: 1000 TD travel mm: 1.4...1.8

mm: (0.9...2.3)

Del.quantity cm3/: 78.0...81.0 1000H.: (76.5...82.5) 3rd speed 1/min: 1050 Charge press. hPa: 1000 TD travel mm: 2.3...3.1 1/min: 750 7th speed mm: (2.0...3.4) Charge press. hPa: 1000 Del.quantity cm3/: 82.0...83.0 1000H.: (79.5...85.5) 8th speed 1/min: 500 Charge press. hPa: 1000 Supply-pump pressure characteristic: 1st speed 1/min: 500 Del.quantity cm3/: 82.0...90.0 hPa: 1000 Charge press. 1000H: -Supply-pump 1/min: 500 pressure bar: 2.1...2.7 9th speed bar: (1.9...2.9) 1/min: 750 Charge press. hPa: -Del.quantity cm3/: 40.0...41.0 1000H: (36.5...44.5) 2nd speed hPa: 1000 Charge press. Supply-pump bar: 3.2...3.8 Zero delivery (stop): pressure bar: (3.0...4.0) 1/min: 1050 3rd speed Mech. shutoff: Charge press. hPa: 1000 1/min: 1250 Supply-pump Speed Del.quantity cm3/: 0..3 1000H.: bar: 4.3...4.9 pressure bar: (4.1...5.1) Overflow quantity at overflow valve: Idle delivery: 1st speed 1/min: 375
Del.quantity cm3/: 4.0...8.0
1000H.: (1.0...11.0) 1/min: 500 1st speed Charge press. hPa: -Oveflow : 4' : 41...83 quantity cm3/10s: (26...98) 1/min: 500 2nd speed Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) 2nd speed 1/min: 1250 Charge press. hPa: 1000 verflow : 55...138
quantity cm3/10s: (40...153) Overflow Automatic starting fuel delivery: Delivery-quant. and breakaway char.: 1st speed 1/min: 200 Del.quantity cm3/: -1000H: 60.0 ind. 1st speed 1/min: 700\* Charge-air pressure-setting point hPa: 450 1/min: 370 point 2nd speed Del.quantity cm3/: 67.0...68.0 1000H.: (63.0...72.0) Del.quantity cm3/: - max. 1000H: 60.0 max. 1/min: 1400 2nd speed Charge press. hPa: 1000
Del.quantity cm3/: 0.0...3.0
1000H.: (0.0...3.0)
3rd speed 1/min: 1330 Mounting and assembly dimensions: Designation K mm Charge press. hPa: 1000 **KF** : 5.0...5.4 mm Del.quantity cm3/: 15.0...55.0 1000H.: (15.0...55.0) : 1.2...1.6 MS mm SVS max. mm 1/min: 1300 4th speed Charge press. hPa: 1000
Del.quantity cm3/: 65.0...71.0
1000H.: (62.0...74.0)
5th speed 1/min: 1250 Remarks: : C.D.C. # 391 7038 Operate control lever after each manifold-pressure compensator pressure Charge press. hPa: 1000
Del.quantity cm3/: 73.5...76.5
1000H.: (72.0...78.0)
6th speed 1/min: 1050 change. \* Correction at adjusting nut (46) Charge press. hPa: 1000

Note inst. in remarks column

Test sheet : CUM 5.9 U46 Edition : 23,10,89

replaces

: ISO 4113 Calibrating oil

Injection pump : VE 6/12F1250 R373-4

: 0 460 426 150 Type number

Customer-specific information

Customer : CDC

: 6 BTA - 590 Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. "C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening |

bar: 250...253 pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Lenath

Start of delivery

mm : 0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.85

mm: +-0.02(0.06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 1.4...1.8

Supply-pump pressure:

1/min: 750 Charge press. hPa: 1000 Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750 Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 82.0...83.0

Dispersion cm3/: 4.01000H: (4.5)

Full-load del. w/out charge press.:

1/min : 500 Speed

Del.quantity cm3/

1000H.: 40.0...41.0

Low-idle speed regulation:

1/min: 375 Speed Charge press. hPa: -Del.quantity cm3/

1000H.: 4.0...8.0

cm3/: 5.5 Dispersion 1000H.: (7.0)

Full-load speed regulation:

1/min: 1300 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 65.0...71.0

Start:

2nd speed

1/min: 100 Speed Charge press. hPa: -Del.quantity cm3/1000H.: 70.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 600 1st speed Charge press. hPa: 1000

TD travel mm: 0.4...1.2

mm: (0.1...1.5) 1/min: 750

Charge press. hPa: 1000 TD travel mm: 1.4...1.8

mm: (0.9...2.3)

3rd speed 1/min: 1050	+	Del.quantity cm3/: (8.081.0
Charge press. hPa: 1000	+	1000H.: (76.582.5)
TD travel mm: 2.33.1	+	7th speed 1/min: 750
mm: (2.03.4)	+	Charge press. hPa: 1000
	+	Del.quantity cm3/: 82.083.0
Supply-pump pressure characteristic:	+	1000H.: (79.585.5)
	+	8th speed 1/min: 500
1st speed 1/min: 500	+	Charge press. hPa: 1000
Charge press. hPa: 1000	1	Del.quantity cm3/: 82.090.0
Supply-pump		1000H: -
pressure bar: 2.12.7	1	9th speed 1/min: 500
bar: (1.92.9)	T	Charge press. hPa: +
2nd award 4/min 250	T	Del guardida em7/a /0 0 /1 0
2nd speed 1/min: 750	†	Del.quantity cm3/: 40.041.0
Charge press. hPa: 1000	+	1000H: (36.045.0)
Supply-pump	+	
pressure bar: 3.23.8	+	Zero delivery (stop):
bar: (3.04.0) 3rd speed 1/min: 1050	+	
3rd speed 1/min: 1050	+	Mech. shutoff:
Charge press. hPa: 1000	1	
Supply-pump	1	Speed 1/min: 1250
pressure bar: 4.34.9	1	Del.quantity cm3/: 03
bar: (4.15.1)	1	1000H.: -
Dar: (4.1).17	T	1000n.
Quantity of supplies of	T	Floren shubaff.
Overflow quantity at overflow valve:	Ť	Electr. shutoff:
A	+	444
1st speed 1/min: 500	+	Speed 1/min: 375
Charge press. hPa: -	+	ELAB volt: -
Oveflow : 4183	+	Del.quantity cm3/: 0.03.0
quantity cm3/10s: (2698)	+	max. 1000H.: -
2nd speed 1/min: 1250	1	
Charge press. hPa: 1000	1	Idle delivery:
Overflow : 55138	T	Tate decivery.
0Ver 10W : JJ130	T	1st speed 1/min: 375
quantity cm3/10s: (40153)	T	181 Speed 1/111111 3/3
	+	Del.quantity cm3/: 4.08.0
Delivery-quant. and breakaway char.:	+	1000H.: (1.011.0)
	+	2nd speed 1/min: 500
1st speed 1/min: 700*	+	Del.quantity cm3/: 0.04.0
Charge-air pressure-setting	+	1000H.: (0.04.0)
point hPa: 450	+	
Del.quantity cm3/: 67.068.0	+	Automatic starting fuel delivery:
1000H.: (63.571.5)	+	
2nd speed 1/min: 1400	1	1st speed 1/min: 200
Charge press. hPa: 1000	1	Del.quantity cm3/: -
Del.quantity cm3/: 0.03.0	$\perp$	ind. 1000H: 60.0
1000H.: (0.03.0)	I	100011. 00.0
	T	2nd speed 1/mins 270
3rd speed 1/min: 1330	T	2nd speed 1/min: 370
Charge press. hPa: 1000	+	Del.quantity cm3/: -
Del.quantity cm3/: 15.055.0	+	max. 1000H: 60.0
1000H.: (15.055.0)	+	
4th speed 1/min: 1300	+	Shutoff electromagnet:
Charge press. hPa: 1000	+	
Del.quantity cm3/: 65.071.0	+	Cut-in
1000H.: (62.074.0)	1	min. voltage : 20.0
5th speed 1/min: 1250	1	Rated voltage : 24.0
	1	HATCH TOSTINGO I ETIU
	Ι	Mounting and assembly dimensions:
Del.quantity cm3/: 73.576.5 1000H.: (72.078.0)		TRUBELLE REPORTED TO A STATE OF THE PROPERTY O
ULAM: 177.D(8.11)		
	+	
6th speed 1/min: 1050	+	Designation
	+	

mm : 1.2...1.6 mm : 2.2 MS SVS max.

Remarks:

: C.D.C. # 391 7037 Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

Test sheet : CUM 5.9 W7 : 24.10.89 Edition

replaces

: ISO 4113 Calibrating oil

: VE 6/12F1100 R373-5 Injection pump

Customer-specific information

Customer : CDC

Engine : 6 BT - 5.9 IND.

k: 127.0 Power 1/mi: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated plate

mm: 0.5 diameter

Test ini. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm:0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.85

mm: +-0.02(0.06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timina-device travel:

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 1.3...1.7

Supply-pump pressure:

1/min: 750 Speed Charge press. hPa: 1000 Setting value bar: 3.2...3.8

Full-load del. with charge press.:

1/min: 750 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H.: 83.0...84.0

cm3/: 4.0Dispersion 1000H: (4.5)

Full-load del. w/out charge press.:

 $1/\min : 500$ Speed

Del.quantity cm3/

1000H.: 67.5...68.5

Dispersion cm3/: 9.01000H.: -

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 9.0...13.0

cm3/: 5.5 Dispersion

1000H.: (7.0)

Full-load speed regulation:

1/min: 1150 Speed Charge press. hPa: 1000 Del.quantity cm3/ 1000H: 60.0...66.0

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 80.0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 600 1st speed Charge press. hPa: 1000

TD travel mm: 0.4...1.2mm: (0.1...1.5)

1/min: 750 2nd speed Charge press. hPa: 1000

TD travel mm: 1.31.7 mm: (0.82.2)	+ Charge press. hPa: 1000 + Del.quantity cm3/: 80.583.5
3rd speed 1/min: 1100 Charge press. hPa: 1000	Del.quantity cm3/: 80.583.5 + 1000H.: (79.085.0) + 7th speed 1/min: 750
TD travel mm: 2.23.0	+ Charge press. hPa: 1000
mm: (1.93.3)	Del.quantity cm3/: 83.084.0 1000H.: (80.586.5)
Supply-pump pressure characteristic:	
1st speed 1/min: 600	Del.quantity cm3/: 81.089.0
Charge press. hPa: 1000	+ 1000H: −
Supply-pump pressure bar: 2.63.2	+ 9th speed 1/min: 500 + Charge press. hPa: -
bar: (2.43.4) 2nd speed 1/min: 750	1 Deliquantity cm3/: 67.568.5
2nd speed 1/min: 750 Charge press. hPa: 1000	1000H: (63.572.5)
Supply-pump	Zero delivery (stop):
pressure bar: 3.23.8	Mech. shutoff:
bar: (3.04.0) 3rd speed 1/min: 1100	mech. shutorr:
Charge press. hPa: 1000	+ Speed 1/min: 1100
Supply-pump pressure bar: 4.75.3	+ Del.quantity cm3/: 03 + 1000H.: -
bar: (4.55.5)	+
Overflow quantity at overflow valve:	Electr. shutoff:
over tow quantity at over itow valve.	Speed 1/min: 375
1st speed 1/min: 500	+ ELAB volt: -
Charge press. hPa: - Oveflow : 4183	Del.quantity cm3/: 0.03.0 max. 1000H.: -
quantity cm3/10s: (2698)	+
2nd speed 1/min: 1100 Charge press. hPa: 1000	idle delivery:
Overflow : 55138	1st speed 1/min: 375
quantity cm3/10s: (40153)	Del.quantity cm3/: 9.013.0 1000H.: (6.016.0)
Delivery-quant. and breakaway char.:	+ 2nd speed 1/min: 500
• •	<pre>+ Del.quantity cm3/: 0.04.0</pre>
1st speed 1/min: 700* Charge-air pressure-setting	1000H.: (0.04.0)
point hPa: 400	Automatic starting fuel delivery:
Del.quantity cm3/: 77.578.5 1000H.: (73.582.5)	+ 1st speed 1/min: 280
2nd speed 1/min: 1260	Del.quantity cm3/: -
Charge press. hPa: 1000	ind. 1000H: 80.0
Del.quantity cm3/: 0.03.0 1000H.: (0.03.0)	T 2nd speed 1/min: 440
3rd speed 1/min: 1200	Del.quantity cm3/: - max. 1000H : 80.0
Charge press. hPa: 1000 Del.quantity cm3/: 15.055.0	† max. 1000H: 80.0
1000H.: (15.055.0)	+ Shutoff electromagnet:
4th speed 1/min: 1150	+ Cut-in
Charge press. hPa: 1000 Del.quantity cm3/: 60.066.0	in. voltage : 10.0
1000H.: (57.069.0)	Rated voltage : 12.0
5th speed 1/min: 1100 Charge press. hPa: 1000	† Mounting and assembly dimensions:
Del.quantity cm3/: 78.581.5	+
1000H.: (77.083.0) 6th speed 1/min: 900	+ Designation + K mm : -
om specu i/miii /ou	HATE •

KF MS mm : 5.0...5.4 mm : 1.0...1.4

SVS max.

Remarks:

: C.D.C. # 391 6910

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CUM 5,9W12 Test sheet Edition : 14.11.89

replaces

Calibrating oil : ISO 4113

: VE 6/12F1100 R381-1 Injection pump

Type number : 0 460 426 153

Customer-specific information

Customer : CDC

Engine : 6 BT-5.9 IND.

k: 104 Power 1/mi: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ., C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

**Opening** 

bar: 250...253 pressure

Perforated plate

diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm : 0,3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1,5

mm: +-0.02(0.06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed Setting value mm: 3,4...3,8

Supply-pump pressure:

1/min: 750 Speed Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

1/min: 750

Del.quantity cm3/

1000H.: 71,5...72,5

cm3/: 4.0 Dispersion

1000H.: (4,5)

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/

1000H.: 8,0...14,0

cm3/: 5,5 Dispersion 1000H.: (7,0)

Full-load speed regulation:

1/min: 1140 Speed

Del.quantity cm3/

1000H: 53,0...59,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 60.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 500

mm: 1,5...2,3 mm: (1,2...2,7) TD travel

2nd speed 1/min: 750

mm: 3,4...3,8 mm: (2,9...4,3) TD travel

1/min: 1100 3rd speed

mm: 5,2...6,0 mm: (4,9...6,3) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2,4...3,0 1/min: 750 pressure

Supply-pump bar: 3,5...4,1 pressure 1/min: 1100 3rd speed Supply-pump pressure bar: 4,8...5,4 Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Oveflow cm3/10s: (26...98) quantity 1/min: 1100 2nd speed verflow : 55...138
quantity cm3/10s: (40...153) Overflow Delivery-quant. and breakaway char .: 1st speed 1/min: 1220 Del.quantity cm3/: 0,0...3,0 1000H.: -1/min: 1160 Del.quantity cms/...
1000H.: -2nd speed cm3/: 15,0...45,0 3rd speed 1/min: 1140 Del.quantity cm3/: 53,0...59,0 1000H.: (50,0...62,0) 1/min: 1100 4th speed Del.quantity cm3/: 66,5...69,5 1000H.: (65,0...71,0) 1/min: 900 5th speed Del.quantity cm3/: 71,5...(2,5) 1000H.: (69,0...75,0) 6th speed 1/min: 750 Del.quantity cm3/: 70,5...74,5 1000H.: (68,5...76,5) 1/min: 500 7th speed Del.quantity cm3/: 56,0...64,0 1000H.: (54,0...66,0) Zero delivery (stop): Mech. shutoff: 1/min: 1100 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: Speed 1/min: 375 volt: 24,0 ELAB Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 8,0...14,0 1000H.: (6,0...16,0)

1/min: 450

Del.quantity cm3/: 0,0...4,0 1000H.: -Automatic starting fuel delivery: 1/min: 130 1st speed Del.quantity cm3/: -1000H: 60,0 ind. 1/min: 240 2nd speed Del.quantity cm3/: -max. 1000H: 60,0 Shutoff electromagnet: Cut-in : 20,0 min. voltage : 24,0 Rated voltage Mounting and assembly dimensions: Designation K TITL : 5,0...5,4 KF : 0,8...1,2 MS mm SVS max. mm : 1.4Remarks:

Note inst. in remarks column

Test sheet : CUM 5.9 W8 Edition : 25,10,89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2

: 0 460 426 154 Type number

Customer-specific information

Customer : CDC

Engine : 6 BT - 5.9 IND.

k: 89.0 Power 1/mi: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. "C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina .

bar: 250...253 pressure

Perforated-plate

mm : 0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness mm: 840 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.5

mm:  $\pm 0.02(0.06)$ 

Outlet : D

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed Setting value mm: 3.4...3.8

Supply-pump pressure:

1/min: 750 Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

1/min: 750 Speed

Del.quantity cm3/ 1000H.: 62.0...63.0

cm3/: 4.0 Dispersion 1000H.: (4.5)

Low-idle speed regulation:

1/min: 375 Speed Del.quantity cm3/ 1000H.: 10.0...12.0

cm3/: 5.5Dispersion 1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150

Del.quantity cm3/

1000H: 39.0...45.0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 70.0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 500 1st speed

mm: 1.5...2.3 mm: (1.2...2.6) 1/min: 750 TD travel

2nd speed

TD travel mm: 3.4...3.8 mm: (2.9...4.3)

1/min: 1100 3rd speed

mm: 5.6...6.4 mm: (5.3...6.7)) TD travel

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump

bar: 2.4...3.0 1/min: 750 pressure

Del.quantity cm3/: 0.0...4.0 1000H.: (0.0...4.0) Supply-pump bar: 3.5...4.1 pressure 3rd speed 1/min: 1100 Automatic starting fuel delivery: Supply-pump pressure bar: 4.8...5.4 1/min: 130 1st speed Del.quantity cm3/: -Overflow quantity at overflow valve: 1000H: 70.0 ind. 1st speed 1/min: 500 : 41...83 1/min: 300 Oveflow 2nd speed Del.quantity cm3/: - max. 1000H: 80.0 cm3/10s: (26...98) quantity 1/min: 1100 2nd speed max. : 55...138 Overflow quantity cm3/10s: (40...153) Shutoff electromagnet: Delivery-quant. and breakaway char.: Cut-in : 20.0 min. voltage Rated voltage : 24.0 1st speed 1/min: 1250 Mounting and assembly dimensions: 1/min: 1170 2nd speed Del.quantity cm3/: 13.0...55.0) Designation Κ mm KF : 5.0...5.4 3rd speed 1/min: 1150 m Del.quantity cm3/: 39.0...45.0 1000H.: (36.0...48.0) : 1.2...1.6 MS mm SVS max. mm 4th speed 1/min: 1100 Del.quantity cm3/: 59.0...oz.u 1000H.: (57.5...63.5) Remarks: : 1/min: 900 5th speed Del.quantity cm3/: 61.5...66.5)
4th speed 1/min: 750 1/min: 500 7th speed Del.quantity cm3/: 57.0...65.0 1000H.: -Zero delivery (stop): Mech. shutoff: 1/min: 1100 Speed Del.quantity cm3/: 0..3 1000H .: -Electr. shutoff: Speed 1/min: 375 ELAB volt: -Del.quantity cm3/: 0.0...3.0 1000H.: max. Idle delivery: 1/min: 375 1st speed cm3/: 10...12 Del.quantity 1000H.: (6.0...16.0) 1/min: 500 2nd speed

Note inst. in remarks column

: CUM 5.9 W13 Test sheet Edition : 15.11.89

replaces

Calibrating oil : ISO 4113

: VE 6/12F1100 R381-3 Injection pump

Type number : 0 460 426 155

Customer-specific information

Customer : CDC

: 6 BT - 5.9 IND. Engine

k: 105 Power 1/mi: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. .. C .

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening 1 control

bar: 250...253 pressure

Perforated-plate

diameter mm:0.5

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm: 840 x Lenath

Start of delivery

mm:0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1.5

mm: +-0.02(0.06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 750 Speed mm: 3.4...3.8 Setting value

Supply-pump pressure:

1/min: 750 Speed Setting value bar: 3.7...4.3

Full-load del. w/out charge press.:

1/min: 750

Deliquantity cm3/

1000H.: 75,0...76,0

Dispersion cm3/: 4.01000H.: (4.5)

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 10.0...12.0 Dispersion cm3/: 5.5

1000H.: (7.0)

Full-load speed regulation:

1/min: 1100 Speed

Del.quantity cm3/

1000H: 52.0...58.0

Start:

Speed 1/min: 100 Del.quantity

cm3/1000H.: 60.0 mind i

Inspection pump test specifications Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 500

mm: 1.3...2.1 TD travel mm: (1.0...2.4)

1/min: 750 2nd speed

TD travel mm: 3.4...3.8

mm: (2.9...4.3) 1/min: 1050

3rd speed

TD travel mm: 5.0...5/8

mm: (4,7...6,1)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2.6...332 1/min: 750 pressure

Del.quantity cm3/: 0.0...4.0 1000H.: -Supply-pump bar: 3.7...4.3 1/min: 1050 pressure 3rd speed Automatic starting fuel delivery: Supply-pump bar: 4.9...5.5 pressure 1/min: 130 1st speed Overflow quantity at overflow valve: Del.quantity cm3/: -1000H: 60.0 ind. 1/min: 500 1st speed : 41...83 1/min: 240 Oveflow 2nd speed cm3/10s: (26...98) quantity Del.quantity cm3/: -1000H: 60.0 1/min: 1050 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Shutoff electromagnet: Delivery-quant. and breakaway char.: Cut-in min. voltage : 10.0 1/min: 1200 Rated voltage : 12.0 1st speed Del.quantity cm3/: 0.0...3.0 1000H.: (0.0...3.0) Mounting and assembly dimensions: 1/min: 1130 cm3/: 15.0...45.0 2nd speed Del.quantity cms/: 1000H.: -Designation K mm KF : 5.0...5.4 1/min: 1100 3rd speed Del.quantity cm3/: 52.0...58.0 : 0,8...1.2 MS 1000H.: (49.0...61.0) SVS max. mm 1/min: 1050 4th speed Del.quantity cm3/: 69,5...72,5 1000H.: (68,0...74,0) Remarks: 1/min: 900 5th speed Del.quantity cm3/: (2,3....77,5) 1/min: 750 6th speed Del.quantity cm3/: 75.0...76.0 1000H.: (72.5...78.5) 7th speed 1/min: 500 Del.quantity cm3/: 61,5...69,5 1000H.: (59,5...71,5) Zero delivery (stop): Mech. shutoff: 1/min: 1050 Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: Speed 1/min: 375 ELAB volt: -Del.quantity cm3/: 0.0...3.0 1000H .: max. Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 10,0...12, 1000H.: (6.0...16.0)

2nd speed

1/min: 450

Note inst. in remarks column

: CUM 5,9 W14 Test sheet Edition : 15.11.89

replaces

Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-4

: 0 460 426 156 Type number

Customer-specific information

Customer : CDC

: 6 BT-5.9 IND. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. , C . with thermometer : 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

bar: 250...253 pressure

Perforated plate

mm : 0.5diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

mm : 0.3Prestroke

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke

mm: 1,5 mm: +0,02(0,06)

: D Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 900 Speed

Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 900 Setting value bar: 4,7...5,3

Full-load del. w/out charge press.:

 $1/\min : 1000$ Speed

Del.quantity cm3/ 1000H.: 67,0...68,0

cm3/: 4,0 Dispersion

1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 400

Del.quantity cm3/ 1000H.: 11,0...13,0 Dispersion cm3/: 5,5

1000H.: (7,0)

Full-load speed regulation:

1/min: 1150 Speed

Del.quantity cm3/

1000H: 44,3...50,3

Start:

1/min: 100 Speed

Del.quantity cm3/1000H.: 70,0 mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

mm: 2,9...3,7 mm: (2,6...4,0) TD travel

1/min: 900 2nd speed

TD travel

mm: 4,2...4,6 mm: (3,7...5,1)

1/min: 1100 3rd speed

mm: 5,5...6,3 mm: (5,2...6,6) TD travel

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2,9...3,5 pressure

1/min: 750 2nd speed

Supply-pump

bar: 4,0...4,6 1/min: 900 pressure

3rd speed

Supply-pump bar: 4,7...5,3 pressure 1/min: 1100 4th speed Supply-pump bar: 5,5...6,1 pressure Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Oveflow cm3/10s: (26...98) quantity 1/min: 1100 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1240 1st speed Del.quantity cm3/: u 1000H.: cm3/: 0,0...3,01/min: 1180 2nd speed Del.quantity cm5/: 1000H.: -2nd speed cm3/: 15,0...55,0 1/min: 1150 3rd speed Del.quantity cm3/: 44,3...53,3) 4th speed 1/min: 1100 Del.quantity cm3/: 64,5...67,5 1000H.: (63,0...69,0) 5th speed 1/min: 1000 Del.quantity cm3/: 67.0...68.0 1000H.: (64,5...70,5) 1/min: 750 6th speed Del.quantity cm3/: 83,0...87,0 1000H.: (81,0...89,0) Zero delivery (stop): Mech. shutoff: 1/min: 1100 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 400 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 Idle delivery: 1st speed 1/min: 400 Del.quantity cm3/: 11,0..13,0 1000H.: (7,0...17,0) 1/min: 500 2nd speed Del.quantity cm3/: 0,0...4,0 1000H .: -Automatic starting fuel delivery:

1st speed 1/min: 130 Del.quantity cm3/: ind. 1000H: 80,0

2nd speed 1/min: 250 Del.quantity cm3/: max. 1000H: 100,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -KF mm : 5,0...5,4 MS mm : 1,3...1,7 SVS max. mm : 2,2

Remarks:

Note inst. in remarks column

: CUM 5,9 W15 Test sheet Edition : 15.11.89

replaces

Calibrating oil : ISO 4113

: VE 6/12F1100 R381-5 Injection pump

: 0 460 426 157 Type number

Customer-specific information

Customer : CDC

: 6 BT-5.9 IND. Engine

k: 94 Power 1/mi: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ., C .

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250...253 pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke

e mm: 0,3 (from BDC): +0,02(0,04)

Start of delivery block mm: 1,5 Piston stroke

mm: +0,02(0,06)

Outlet : D

Injection-pump setting values Test specifications in parentheses

Timing device travel:

Speed 1/min: 750 Setting value mm: 3,4...3,8

Supply-pump pressure:

1/min: 750 Speed Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

1/min: 750 Speed

Del.quantity cm3/

1000H.: 64,5...65,5 cm3/: 4,0

Dispersion 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375

Del.quantity cm3/ 1000H.: 10,0...12,0 Dispersion cm3/: 5,5 1000H.: (7,0)

Full-load speed regulation:

1/min: 1100 Speed

Del.quantity cm3/

1000H: 46,0...52,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 70,0 mind i

Inspection-pump test specifications Test specifications in parentheses

Timing device characteristic:

1/min: 500 1st speed

mm: 1,5...2,3 mm: (1,2...2,6) TD travel

1/min: 750 2nd speed

TD travel

mm: 3,4...3,8 mm: (2,9...4,3)

1/min: 1050 3rd speed

TD travel mm: 5,0...5,8mm: (4,7...6,1)

Supply-pump pressure characteristic:

1/min: 500 1st speed

Supply-pump

bar: 2,4...3,0 1/min: 750 pressure

Supply-pump bar: 3,5...4,1 pressure 1/min: 1050 3rd speed Supply-pump bar: 4,6...5,2 pressure Overflow quantity at overflow valve: 1/min: 500 1st speed **Oveflow** : 41...83 cm3/10s: (26...98) quantity 1/min: 1050 : 55...138 2nd speed Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 1250 cm3/: 0,0...3,0 1st speed Del.quantity 1000H.: -1/min: 1130 cm3/: 15,0...55,0 2nd speed Del.quantity 1000H .: -1/min: 1100 3rd speed cm3/: 46,0...52,0 Del.quantity 1000H.: (43,0...55,0) 1/min: 1050 4th speed 1/min: 900 5th speed Del.quantity cm3/: 02,0....67,0) 1/min: 750 óth speed Del.quantity cm3/: 64,5...65,5 1000H.: (62,0...68,0) 1/min: 500 7th speed Del.quantity cm3/: 64,0...72,0 1000H.: -Zero delivery (stop): Mech. shutoff: Speed 1/min: 1050 Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed **ELAB** volt: -Del.quantity cm3/: 0,0...3,0 Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 10,0..12,0 1000H.: (6,0...16,0)

1/min: 500

Del.quantity cm3/: 0,0...4,0 1000H.: -Automatic starting fuel delivery: 1st speed 1/min: 130 Del.quantity cm3/: -1000H: 70,0 ind. 1/min: 350 2nd speed Del.quantity cm3/: - max. 1000H: 70,0 Shutoff electromagnet: Cut-in : 20,0 min. voltage Rated voltage : 24,0 Mounting and assembly dimensions: Designation Κ mm. : 5,0...5,4 KF mm MS : 1,2...1,6 mm Remarks:

2nd speed

Note inst. in remarks column

: PEU 1,7A Test sheet : 09.11.89 Edition : 04.11.87 replaces : ISO 4113 Calibrating oil

: VE 4/ 8F2300 R171 Injection pump Type number : 0 460 484 010

Customer-specific information Customer : PEUGEOT

Engine : XUD7

TEST BENCH REQUIREMENTS

Calibrating oil return temp. ., C

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening 1 4 1

bar: 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm: 450

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing device travel:

1/min: 1250 Setting value mm: 3,4...3,8

Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

1/min: 1250 Speed

Del.quantity\_cm3/

1000H.: 28,0...29,0 cm3/: 2,5

Dispersion 1000H.: -

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 8,0...12,0 Dispersion cm3/: 2,0 1000H.: (3,0)

Residual-Delivery Setting Speed 1/min: 550

Del.quantity cm3/

1000H.: 3,5...4,5

Full-load speed regulation:

1/min: 2440 Speed

Del.quantity cm3/

1000H: 19,0...25,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 42,0 mind i

Load-dependent start of delivery:

1/min: 1250 Speed

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800

mm: 0,8...1,6 mm: (0,5...1,9) 1/min: 1250 TD travel

2nd speed

mm: 3,4...3,8TD travel mm: (3,1...4,1)

1/min: 2000 3rd speed

mm: 7,5...8,3 mm: (7,2...8,6) TD travel

Supply-pump pressure characteristic:

1/min: 800 1st speed

Supply-pump

bar: 3,0...3,6 1/min: 1250 pressure 2nd speed

Supply-pump

pressure bar: 4,3...4,9 1/min: 2000 3rd speed

High Idle: Supply-pump bar: 6,4...7,0 pressure 1/min: 450 Speed Del.quantity cm3/: 8,0...12,0 1000H.: (6,0...14,0) Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Residual: Oveflow quantity cm3/10s: (26...98) 1/min: 2250 2nd speed 1/min: 550 Speed : 55...138 Del.quantity : 3,5...4,5 1000H.: (2,5...5,5) Overflow quantity cm3/10s: (40...153) Automatic starting fuel delivery: Delivery-quant. and breakaway char.: 1/min: 2690 1/min: 200 1st speed 1st speed Del.quantity cm3/: 4,0...10,0 1000H.: (3,5...10,5) Del.quantity cm3/: -1000H: 34,0 ind. 2nd speed 1/min: 2540
Del.quantity cm3/: 11,5...17,5
1000H.: (10,0...19,0)
3rd speed 1/min: 2440
Del.quantity cm3/: 19,0...25,0
1000H.: (18,0...26,0) 2nd speed 1/min: 300 Del.quantity cm3/: -max. 1000H: 64,0 Shutoff electromagnet: 1/min: 2250 4th speed Del.quantity cm3/: 27,0...29,0 1000H.: (25,7...30,3) 5th speed 1/min: 2000 Del.quantity cm3/: 27,5...29,5 1000H.: (26,2...30,8) Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: 1/min: 1250 6th speed Del.quantity cm3/: 28,0...27,0 1000H.: (26,2...30,8) Designation K 7th speed 1/min: 800
Del.quantity cm3/: 28,0...30,0
1000H.: (26,0...32,0) KF MS mm : 3,0 : 18,9...20,9 SVS max. mm 1/min: 500 XK min 8th speed Del.quantity cm3/: 28,0...31,0 : 12,2...15,6 XL 1000H: (26,5...32,5) Remarks: Zero delivery (stop): Mech. shutoff: 1/min: 2250 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 375 1st speed Del.quantity cm3/: 8,0...12,0 1000H.: (6,0...14,0)

Note inst. in remarks column

: VWW 1,4 A Test sheet Edition : 08.11.89

replaces

: ISO 4113 Calibrating oil

Injection pump : VE 4 /8F2450 L331-2

: 0 460 484 033 Type number

Customer-specific information

Customer : VW

: 031.2Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. "C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening 1 continue 1 c

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250 Setting value mm: 2,8...3,2

Supply-pump pressure:

1/min: 1250 Speed Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

1/min: 1500 Speed

Del.quantity cm3/

1000H.: 24,3...25,3

Low-idle speed regulation:

Speed 1/min: 425

Del.quantity cm3/ 1000H.: 9,5...11,5

Residual-Delivery Setting Speed 1/min: 575

Del.quantity cm3/ 1000H.: 2,5...3,5

Full-load speed regulation:

1/min: 2700 Speed

Del.quantity cm3/

1000H: 10,0...14,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 32,0 mind

Load-dependent start of delivery:

1/min: 1250 Speed

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

mm: 0,5...1,3 TD travel mm: (0,2...1,6)

1/min: 1250 2nd speed

TD travel

mm: 2,8...3,2 mm: (2,3...3,7)

1/min: 2250 3rd speed TD travel

mm: 7,3...8,1 mm: (7,0...8,4)

Supply-pump pressure characteristic:

1st speed 1/min: 800

Supply-pump

bar: 3,6...4,2 1/min: 1250 pressure

2nd speed

Supply-pump

bar: 4,9...5,5 pressure

1/min: 2250 3rd speed

Supply-pump

pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1/min: 800 1st speed Oveflow : 41...83 cm3/10s: (26...98) quantity 1/min: 2250 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char .: 1/min: 2950 1st speed Del.quantity cm3/: 0,0...6,0 1000H.: -1/min: 2700 cm3/: 10,0...14,0 2nd speed Del.quantity cm3/: 10,0...16,0) 1/min: 2575 3rd speed Del.quantity cm3/: 15,0...25,0 1000H.: (14,0...26,0) 4th speed 1/min: 2250
Del.quantity cm3/: 23,0...25,0
1000H.: (21,8...26,2) 1/min: 1500 cm3/: 24,3...25,3 5th speed Del.quantity cm3/: 24/3...27,0) 1/min: 800 6th speed Del.quantity cm3/: 21,00...24,0 1000H.: (19,5...25,5) 1/min: 600 7th speed Del.quantity cm3/: 17,0...21,0 1000H.: (14,5...24,5) Zero delivery (stop): Electr. shutoff: 1/min: 450 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 425 1st speed Del.quantity cm3/: 9,5...11,5 1000H.: (6,5...14,5) 1/min: 450 2nd speed Del.quantity cm3/: 5,5...8,5 1000H.: (3,0...11,0) Residual: 1/min: 525 Speed Del.quantity : 3,0...5,0 1000H.: (1,5...6,5) Automatic starting fuel delivery:

Del.quantity cm3/: ind. 1000H: 30,0 2nd speed 1/min: 400 Del.quantity cm3/: max. 1000H: 30,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

KF mm : 3,2...3,4 KF mm : 5,6...6,0 MS mm : 1,2...1,6

Remarks:

1st speed

1/min: 200

Note inst. in remarks column

Test sheet : PEU 1,7 A2 : 03.11.89 Edition

replaces

: ISO 4113 Calibrating oil

Injection pump : VE 4/ 8F2300 R171-2

Type number : 0 460 484 034

Customer-specific information Customer : PEUGEOT

: XUD7 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. "C.

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening

bar: 130...133 pressure

Test ini. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Lenath

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Speed Setting value mm: 3,4...3,8

Supply-pump pressure:

1/min: 1250 Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

1/min: 1250 Speed

Del.quantity cm3/ 1000H.: 28,0...29,0 Dispersion cm3/: 2,0

1000H.: (2,5)

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/

1000H.: 8,0...12,0

cm3/: 2,0 Dispersion 1000H.:

Residual-Delivery Setting Speed 1/min: 550

Del.quantity cm3/

1000H.: 3,5...4,5

Full-load speed regulation:

1/min: 2440 Speed

Del.quantity cm3/ 1000H: 19,0...25,0

Start:

1/min: 100 Speed Del.quantity

cm3/1000H.: 42,0 mind

Load-dependent start of delivery:

1/min: 1250 Speed

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800

TD travel mm: 0,8...1,6mm: (0,5...1,9)

1/min: 1250 2nd speed

TD travel mm: 3,4...3,8 mm: (3,1...4,1)

1/min: 2000 3rd speed

mm: 7,,5...8,3 mm: (7,2...8,6) TD travel

Supply-pump pressure characteristic:

1/min: 800 1st speed

Supply-pump

bar: 3,0...3,6 1/min: 1250 pressure 2nd speed

Supply-pump

bar: 4,3...4,9 pressure

1/min: 2000 3rd speed

High Idle: Supply-pump bar: 6,4...7,0 pressure 1/min: 450 Del.quantity cm3/: 8,0...12,0 1000H.: (6,0...14,0) Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Residual: Oveflow cm3/10s: (26...98) quantity 1/min: 2250 1/min: 550 2nd speed Speed : 55...138 Del.quantity : 3,5...4,5 1000H.: (2,5...5,5) Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: Automatic starting fuel delivery: 1/min: 200 1/min: 2650 1st speed 1st speed Del.quantity cm3/: 3,5...10,5 1000H.: -Del.quantity cm3/: -1000H: 34,0 2nd speed 1/min: 2540
Del.quantity cm3/: 11,5...17,5
1000H.: (10,0...19,0)
3rd speed 1/min: 2440 1/min: 300 2nd speed Del.quantity cm3/: -max. 1000H: 64,0 Del.quantity cm3/: 19,0...25,0 1000H.: (18,0...26,0) Shutoff electromagnet: 4th speed 1/min: 2250
Del.quantity cm3/: 27,5...29,5
1000H.: (26,2...30,8) Cut-in : 10,0 min. voltage 1/min: 2000 Rated voltage 5th speed Del.quantity cm3/: 27,5...29,5 1000H.: (26,2...30,8) Mounting and assembly dimensions: 1/min: 1250 6th speed Del.quantity cm3/: 28,0...29,0 1000H.: (26,2...30,8) Designation m KF 1/min: 800 mm 7th speed Del.quantity cm3/: 28,0...30,0 1000H.: (26,0...32,0) MS XK : 18,7...20,7 1/min: 500 XL 8th speed mm Del.quantity cm3/: 28,0...31,0 1000H: (26,5...32,5) Remarks: Zero delivery (stop): Mech. shutoff: 1/min: 2250 Speed Del.quantity cm3/: 0..3 1000H.: -Electr. shutoff: 1/min: 375 Speed volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1st speed 1/min: 375
Del.quantity cm3/: 8,0...12,0
1000H.: (6,0...14,0)

Note inst. in remarks column

: VWW 1,7A : 02.11.89 Test sheet Edition : 10.12.86 replaces : ISO 4113 Calibrating oil

Injection pump : VE 4/ 9F2250 R187

: D 460 494 164 Type number

Customer-specific information

Customer : VWW

: 086 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C . with thermometer : 40...48 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

assembly : 1 688 901 000

Opening

bar: 147...150 pressure

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500 Setting value bar: 4,8...5,4

Full-load del. w/out charge press.:

1/min: 1500 Speed

Del.quantity cm3/

1000H.: 34,5...35,5 cm3/: 2,5

Dispersion 1000H.: (3,0)

Low-idle speed regulation:

1/min: 450 Speed

Del.quantity cm3/ 1000H.: 6,0...10,0

Dispersion cm3/: 2.0

1000H.: (3,0)

Full-load speed regulation:

1/min: 2450 Speed

Del.quantity cm3/ 1000H: 12,0...18,0

Start:

1/min: 100 Speed Del.quantity mind cm3/1000H.: 35,0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed

mm: 2,1...2,9 mm: (1,8...3,2) TD travel

2nd speed 1/min: 1500

mm: 4,3...4,7 mm: (3,8...5,2) 1/min: 2250 TD travel

3rd speed

mm: 7,4...8,2 mm: (7,1...8,5) TD travel

Supply-pump pressure characteristic:

1/min: 600 1st speed

Supply-pump

bar: 2,5...3,1 1/min: 1500 pressure

2nd speed

Supply-pump

bar: 4,8...5,4 1/min: 2250 pressure

3rd speed

Supply-pump

bar: 6,7...7,3 pressure

Overflow quantity at overflow valve:

1/min: 600 1st speed : 41...83 Oveflow

quantity cm3/10s: (26...98) 1/min: 2250 2nd speed

: 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char .: 1/min: 2600 1st speed Del.quantity cm3/: 0,0...6,0 1000H.: -1/min: 2450 2nd speed Del.quantity cm3/: 12,0...18,0 1000H.: (11,0...19,0) 3rd speed 1/min: 2400 Del.quantity cm3/: 17,0...27,0 1000H.: (16,0...28,0) 4th speed 1/min: 2250
Del.quantity cm3/: 30,5...32,5
1000H.: (29,3...33,7) 5th speed 1/min: 1500 Del.quantity cm3/: 34,5...35,5 1000H.: (32,8...37,2) 6th speed 1/min: 600 Del.quantity cm3/: 24,0...27,0 1000H.: (22,5...28,5) Zero delivery (stop): Electr. shutoff: 1/min: 450 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 max. 1000H.: -Idle delivery: 1/min: 450 1st speed Del.quantity cm3/: 6,0...10,0 1000H.: (4,0...12,0) 1/min: 1200 2nd speed Del.quantity cm3/: 0,0...4,0 1000H.: — Automatic starting fuel delivery: 1st speed 1/min: 360 Del.quantity cm3/: -1000H: 35,0 ind. 2nd speed 1/min: 560 Del.quantity cm3/: -1000H: 35,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 : 12,0 Rated voltage

Remarks:

Mounting and assembly dimensions:

Note inst. in remarks column

: VMA 2,0F Test sheet : 02.11.89 Edition replaces : 03.08.88 Calibrating oil : ISO 4113

: VE 4/ 9F2150 L202 Injection pump Type number : 0 460 494 167

Customer-specific information

Customer : VM

: HR 488 HJ Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. "C

with thermometer: 40...48 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Indicator setting:

Piston stroke mm: 1.0 Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1000 Charge press. hPa: 800 Setting value mm: 1,5...1,9

Supply-pump pressure:

Speed 1/min: 1500 Charge press. hPa: 800 Setting value bar: 4,5...5,1

Full-load del. with charge press.:

1/min: 1500 Speed Charge press. hPa: 800

Del.quantity cm3/ 1000H.: 52,5...53,5 Dispersion cm3/: 3,0 1000H: (3,0)

Full-load del. w/out charge press.:

1/min : 750 Speed

Del.quantity cm3/ 1000H.: 39,5...40,5

Low-idle speed regulation:

Speed 1/min: 400

Del.quantity cm3/ 1000H.: 11,0...15,0 Dispersion cm3/: 2,5 1000H.: (2,5)

Full-load speed regulation:

1/min: 2420 Speed Charge press. hPa: 800 Del.quantity cm3/ 1000H: 12,0...18,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 36,0 mind

Load-dependent start of delivery:

1/min: 1500 Speed Charge press. hPa: -

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed hPa: 800 Charge press. mm: 1,3...2,1 mm: (1,0...2,4) TD travel

1/min: 1500 2nd speed

Charge press. hPa: 800 mm: 4,3...4,7 mm: (3,8...5,2) 1/min: 2150 TD travel

3rd speed

Del.quantity cm3/: 51,5...54,5 1000H.: -Charge press. hPa: 800 mm: 7,6...8,4 mm: (7,3...8,7) TD travel 1/min: 750 7th speed Charge press. hPa: 400 Del.quantity cm3/: 41,5...43,5 1000H.: (40,0...45,0) Supply-pump pressure characteristic: 1/min: 750 1/min: 750 8th speed 1st speed Del.quantity cm3/: 39,5...40,5 1000H: (37,5...42,5) Charge press. hPa: 800 Supply-pump bar: 2,0...2,6 1/min: 1000 pressure Zero delivery (stop): 2nd speed Charge press. hPa: 800 Supply-pump bar: 2,8...3,4 1/min: 1500 Electr. shutoff: pressure 3rd speed Charge press. hPa: 800 1/min: 400 Speed ELAB volt: -Supply-pump Del.quantity cm3/: 0,0...3,0 max. 1000H.: bar: 4,5...5,1 1/min: 2150 pressure 4th speed Charge press. hPa: 800 Idle delivery: Supply-pump bar: 6,7...7,3 pressure 1st speed 1/min: 400 Del.quantity cm3/: 11,0..15,0 1000H.: (8,0...18,0) Overflow quantity at overflow valve: 2nd speed 1/min: 500
Del.quantity cm3/: 2,0...8,0
1000H.: (0,0...10,0) 1st speed 1/min: 750 Charge press. hPa: 800 : 41...83 Oveflow 1/min: 700 quantity cm3/10s: (26...98) 3rd speed Del.quantity cm3/: 0,0...4,0 1000H.: (0,0...4,0) 2nd speed 1/min: 2150 Charge press. hPa: 800 Overflow : 55...138 quantity cm3/10s: (40...153) Automatic starting fuel delivery: 1/min: 400 Delivery-quant. and breakaway char.: 1st speed Del.quantity cm3/: -1000H: 37,0 1/min: 750 ind. 1st speed Charge-air pressure-setting hPa: 400 1/min: 500 point 2nd speed LDA stroke mm: 5,7
Del.quantity cm3/: 41,5...43,5
1000H.: (40,0...45,0)
2nd speed 1/min: 2550 Del.quantity cm3/: - max. 1000H: 45,0 max. Shutoff electromagnet: Charge press. hPa: 800 Del.quantity cm3/: 0,0...2,0 1000H.: -Cut-in min. voltage 1/min: 2420 Rated voltage : 12,0 3rd speed Charge press. hPa: 800 Del.quantity cm3/: 12,0...18,0 1000H.: (11,0...19,0) 4th speed 1/min: 2150 Mounting and assembly dimensions: Designation : 3,2...3,4 : 5,3...5,7 Charge press. hPa: 800 K Del.quantity cm3/: 42,3...45,3 1000H.: (41,6...46,0) KF : 0,6...1,0 MS mm : 1,7 : 17,0...19,0 : 8,8...12,2 1/min: 1500 SVS max. 5th speed mm Charge press. hPa: 800 XK mm Del.quantity cm3/: 52,5...53,5 1000H.: (51,0...55,0) XL mm 1/min: 750 Remarks: 6th speed Charge press. hPa: 800

\* Correction at adjusting nut (46)

Note inst. in remarks column

: VWW 1,6 W17 Test sheet : 03.11.89 Edition : 08.12.86 replaces : ISO 4113 Calibrating oil

: VE 4/ 9F2400 R221 Injection pump Type number : 0 460 494 179

Customer-specific information

Customer

: 086 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ., C .

with thermometer : 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1000 Setting value mm: 1,0...1,8

Supply-pump pressure:

1/min: 600 Speed Setting value bar: 2,1...2,7

Full-load del. w/out charge press.:

1/min: 1500 Speed

Del.quantity cm3/

1000H.: 31,5...32,5 cm3/: 2,5

Dispersion 1000H.: (3,0)

Low-idle speed regulation:

1/min: 375 Speed Del.quantity cm3/

1000H.: 11,0...13,0

cm3/: 2,0Dispersion 1000H.: (3,0)

Residual-Delivery Setting 1/min: 550 Speed

Del.quantity\_cm3/

1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2600

Del.quantity cm3/

1000H: 12,0...16,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 35,0 mind

Load-dependent start of delivery:

1/min: 1250 Speed

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1000 1st speed

TD travel mm: 1,0...1,8mm: (0,7...2,1)

1/min: 1250 2nd speed

mm: 2,1...2,5 mm: (1,6...3,0) TD travel

1/min: 1800 3rd speed

mm: 4,2...5,0 mm: (3,9...5,3) TD travel

1/min: 2400 4th speed

mm: 6,1...6,9 mm: (5,8...7,2) TD travel

Supply-pump pressure characteristic:

1/min: 600 1st speed

Supply-pump

bar: 2,1...2,7 1/min: 1250 pressure

2nd speed

Supply-pump bar: 4,0...4,6 pressure 1/min: 2400 3rd speed Supply-pump bar: 7,3...7,9 pressure Overflow quantity at overflow valve: 1/min: 600 1st speed Oveflow : 41...83 cm3/10s: (26...98) quantity 1/min: 2400 2nd speed : 55...138 Overflow quantity cm3/10s: (40...153) Delivery-quant, and breakaway char.: 1/min: 2800 1st speed cm3/: 0,0...4,0 Del.quantity 1000H .: -1/min: 2600 2nd speed Del.quantity cm3/: 12,0...16,0 1000H.: (10,0...18,0) 1/min: 2500 3rd speed cm3/: 19,0...29,0 1000H.: (18,0...30,0) Del.quantity 1/min: 2400 4th speed Del.quantity cm3/: 27,0...29,0 1000H.: (25,8...30,2) 1/min: 1500 5th speed

Del.quantity cm3/: 31,5...32,5 1000H.: (29,8...34,2)

6th speed 1/min: 600 Del.quantity cm3/: 21,5...24,5 1000H.: (20,0...26,0)

Zero delivery (stop):

Electr. shutoff:

1/min: 425 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 1000H.: -

Idle delivery:

1/min: 375 cm3/: 11,0..13,0 1st speed Del.quantity 1000H.: (8,0...16,0) 1/min: 425 2nd speed Del.quantity cm3/: 5,5...8,5 1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525 Del.quantity cm3/: 7,0...9,0 1000H.: (4,0...12,0) Residual:

1/min: 500 Speed 2,5...4,5 1000H.: (1,0...6,0) Del.quantity

Automatic starting fuel delivery:

1st speed 1/min: 180 Del.quantity cm3/: -1000H: 35,0 ind.

2nd speed 1/min: 380 Del.quantity cm3/: -max. 1000H: 30,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

: 3,2...3,4 : 5,7...6,0 : 1,3...1,5 : 17,0...19,0 : 9,8...13,2 K KF MS XK XL

Remarks:

Note inst. in remarks column

Test sheet : FIA 1,7 P1 : 06.11.89 : 18.12.86 Edition replaces Calibrating oil : ISO 4113

: VE 4/ 9F2400 R242 Injection pump

: 0 460 494 193 Type number

Customer-specific information

Customer : FIAT

: X8/57 Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp. , C .

with thermometer: 40...48 electronically : 42...50

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening |

bar: 130...133 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm: -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500 Charge press. hPa: 1000 Setting value mm: 4,9...5,3

Supply-pump pressure:

1/min: 1500 Speed Charge press. hPa: 1000 Setting value bar: 5,5...6,1 Full-load del. with charge press.:

1/min: 1500 Speed Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 35,5...36,5 Dispersion cm3/: 3,0 1000H: -

Full-load del. w/out charge press.:

1/min : 750 Del.quantity cm3/

1000H.: 25,3...26,3

Low-idle speed regulation:

1/min: 400 Speed

Del.quantity cm3/

1000H.: 4,0...8,0 Dispersion cm3/: 3,0

1000H.: -

Full-load speed regulation:

Speed 1/min: 2650 Charge press. hPa: 1000

Del.quantity cm3/ 1000H: 17,0...23,0

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 48,0 mind

Load-dependent start of delivery:

1/min: 1500 Speed Charge press. hPa: -

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 750 1st speed hPa: 1000 Charge press. mm: 1,3...2,1 mm: (1,0...2,4) TD travel 1/min: 1500 2nd speed

hPa: 1000 Charge press. mm: 4,9...5,3 mm: (4,4...5,8) 1/min: 2000 TD travel

3rd speed hPa: 1000 Charge press.

mm: 6,9...7,5 mm: (6,5...7,9) 1/min: 2400 TD travel

4th speed

Charge press. hPa: 1000	<pre>Del.guantity cm3/: 35,536,5</pre>
TD travel mm: 8,59,3	+ Del.quantity cm3/: 35,536,5 + 1000H.: (33,738,3)
mm: (8,29,6)	7th speed 1/min: 1100
111111 (0)2000/00	Charge press. hPa: -
Supply-pump pressure characteristic:	- Del.quantity cm3/: 24,027,0
supply pump pressure that acter is the.	1000H.: -
1st speed 1/min: 750	8th speed 1/min: 1100
	Change phone has 100
Charge press. hPa: 1000	+ Charge press. hPa: 400
Supply-pump	+ vel.quantity clib/: 27,550,5
pressure bar: 3,64,2 2nd speed 1/min: 1500	Del.quantity cm3/: 29,530,5 1000H: (27,033,0)
Zna speed 1/min: 1500	+ Yth speed 1/min: /bu
Charge press. hPa: 1000	+ Charge press. hPa: -
Supply-pump	- Del.quantity cm3/: 25,326,3
pressure bar: 5,56,1	1000H: (22,828,8)
3rd speed 1/min: 2000	+
Charge press. hPa: 1000	<pre>- Zero delivery (stop):</pre>
Suipply-pump	+
pressure bar: 6.57.1	1
4th speed 1/min: 2400	<pre>‡ Electr. shutoff:</pre>
Charge press. hPa: 1000	
Supply-pump	+ Speed 1/min: 400
pressure bar: 7,68,2	+ ELAB volt: -
pressure bar, 1/0.110/2	Del.quantity cm3/: 0,03,0
Overflow quantity at overflow valve:	
overstow quantity at overstow valve.	† max. 1000H.: -
1-4 1 1/min 750	Talle delitions
1st speed 1/min: 750	+ Idle delivery:
Charge press. hPa: -	4.4
Oveflow : 4183	+ 1st speed 1/min: 400
quantity cm3/10s: (2698)	Del.quantity cm3/: 4,08,0 1000H.: (2,010,0)
2nd speed 1/min: 2400	+ 1000H.: (2,010,0)
Charge press. hPa: 1000	+ 2nd speed 1/min: 350
Overflow: 55138	Del.quantity cm3/: 12,517,5
quantity cm3/10s: (40153)	+ 1000H.: -
	+ 3rd speed 1/min: 520
Delivery quant. and breakaway char.:	4 Del.quantity cm3/: 0,03,0
	Del.quantity cm3/: 0,03,0 1000H.: -
1st speed 1/min: 1100	
Charge-air pressure-setting	Automatic starting fuel delivery:
point hPa: 400	
LDA stroke mm: 6,6	1st speed 1/min: 250
	Del.quantity cm3/: -
Del.quantity cm3/: 29,530,5	1 ind 1000u 78 0
1000H.: (27,033,0)	f ind. 1000H: 38,0
2nd speed 1/min: 2950	T 2nd annual 1/min. 250
Charge press. hPa: 1000	+ 2nd speed 1/min: 350
Deliquantity cm3/: 0,03,0	+ Del.quantity cm3/: -
1000H.: -	max. 1000H: 34,0
3rd speed 1/min: 2850	
Charge press. hPa: 1000	+ Shutoff electromagnet:
Deliquantity cm3/: 0,06,0	+
1000H.: -	+ Cut-in
4th speed 1/min: 2650	+ min. voltage : 10,0
Charge press. hPa: 1000	+ Rated voltage : 12,0
Del.quantity cm3/: 17,023,0	+
1000H.: (16,024,0)	Mounting and assembly dimensions:
5th speed 1/min: 2400	-
Charge press. hPa: 1000	+ Designation
Del quantity cm3/ 36.5 39.5	+ K mm : 3,23,4
Del.quantity cm3/: 36,539,5 1000H.: (35,740,3)	KF mm : 5,76,0
6th speed 1/min: 1500	T MS mm : 1,41,65
	+ SVS max. mm : -
Charge press. hPa: 1000	T. 242 HRV. HAH.

XK XL mm : 17,0...19,0 mm : 9,1...12,5

# Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

Test sheet : PEU 1,9 K5 Edition : 06.11.89

replaces

Calibrating oil : ISO 4113

: VE 4/ 9F2300 R272-1 Injection pump

Type number : 0 460 494 222

Customer-specific information Customer : PEUGEOT

: XUD9A Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. , C .

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening

pressure bar: 130...133

Test inj, tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm : 450 x Length

Start of delivery Prestroke mm: -(from BDC): -

Indicator setting: Piston stroke mm: 0.3 Outlet

Injection pump setting values Test specifications in parentheses

Timing device travel:

Speed 1/min: 1250 Setting value mm: 3,0...3,4

Supply-pump pressure:

Speed 1/min: 1250 Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

1/min: 1250

Del.quantity cm3/

1000H.: 30,3...31,3 cm3/: 2,5

Dispersion

1000H.: -

Low-idle speed regulation:

1/min: 375 Speed

Del.quantity cm3/ 1000H.: 8,0...10,0 Dispersion cm3/: 2,5

1000H.: -

Residual-Delivery Setting 1/min: 550 Speed

Del.quantity cm3/ 1000H.: 0,0...6,0

Full-load speed regulation:

Speed 1/min: 2500

Del.quantity cm3/

1000H: 19,0...25,0

Start:

Speed 1/min: 100 Del.quantity

cm3/1000H.: 45,0 mind

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 0,6...1,4 mm: (0,3...1,7) TD travel

1/min: 1250 2nd speed

TD travel

mm: 3,0...3,4 mm: (2,7...3,7) 1/min: 2000

3rd speed mm: 6,7...7,5 mm: (6,4...7,8) TD travel

Supply-pump pressure characteristic:

1/min: 800 1st speed

Supply-pump

pressure bar: 2,6...3,2

1/min: 1250 2nd speed

K19

Supply-pump bar: 3,9...4,5 pressure 1/min: 2000 3rd speed Supply-pump bar: 5,9...6,5 pressure Overflow quantity at overflow valve: 1/min: 500 1st speed : 41...83 Oveflow quantity cm3/10s: (26...98) 1/min: 2250 : 55...138 2nd speed Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1st speed 1/min: 2650 Del.quantity cm3/: 0,0...10,0 1000H.: -1/min: 2500 2nd speed Del.quantity cm3/: 19,0...25,0 1000H.: (18,0...26,0) 1/min: 2250 3rd speed Del.quantity cm3/: 32,3...35,3 1000H.: (31,5...36,1) 4th speed 1/min: 1250
Del.quantity cm3/: 30,3...31,3
1000H.: (28,5...33,1) 1/min: 800 5th speed Del.quantity cm3/: 31,3...34,3 1000H.: (30,3...35,3) 1/min: 500 6th speed Del.quantity cm3/: 31,3...34,3 1000H.: (30,3...35,3) Zero delivery (stop): Idle delivery: High Idle: Speed 1/min: 470 Del.quantity cm3/: 8,0...10,0 1000H.: (5,0...13,0) Residual:

1/min: 550

Automatic starting fuel delivery:

1/min: 200

: 2,5...3,5

1000H.: (0,0...6,0)

Del.quantity cm3/: -1000H: 40,0 ind. 2nd speed 1/min: 300 Del.quantity cm3/: -max. 1000H: 35,0 Shutoff electromagnet: Cut-in min. voltage : 10,0 Rated voltage : 12,0 Mounting and assembly dimensions: Designation : 3,2...3,4 : 5,3...5,7 : 1,2...1,6 K nen KF mm MS Remarks:

Speed

Del.quantity

1st speed

Note inst. in remarks column

: OPE 1,7 A : 09.11.89 Test sheet Fdition : 16.01.89 replaces Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 R313 : 0 460 494 229 Type number

Customer-specific information

: OPEL Customer

: 17 YD Engine -

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. "C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Lenath

Start of delivery Prestroke mm : -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000 Setting value mm: 2,0...2,4 KSB solenoid-operated volt: 12,0 valve

Supply-pump pressure:

1/min: 1000 Setting value bar: 4,0...4,6 KSB solenoid-operated volt: 12,0 valve

Full-load del. w/out charge press.:

1/min: 1300 Speed

Del.quantity cm3/ 1000H.: 31,1...32,1

KSB solenoid-operated volt: 12,0 cm3/: 2,5 1000H.: (2,5) valve Dispersion

Low-idle speed regulation:

1/min: 400

Del.quantity cm3/ 1000H.: 8,5...12,5

KSB solenoid-operated volt: 12,0 cm3/: 2,5 valve Dispersion 1000H.: (2,5)

Residual-Delivery Setting Speed 1/min: 500

Del.quantity cm3/ 1000H.: 1,5...2,5

KSB-Solenoid-Operated Volt : 12,0 cm3/: 3,0 valve Dispersion 1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2575

Del.quantity cm3/

1000H: 18,5...24,5

KSB solenoid-operated volt: 12,0 valve

Start:

1/min: 100

: 28,0...48,0 Del.quantity

mind cm3/1000H.: -KSB solenoid-operated volt: 12,0 valve

Load-dependent start of delivery:

Speed 1/min: 1000

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 300

TD travel mm: 0,8...3,2

mm: -

KSB solenoid-operated	- KSB solenoid-operated
valve volt: -	- valve volt: 12,0
2nd speed 1/min: 800	- Overflow : 55138
TD travel mm: 1,94,3 mm: -	quantity cm3/10s: (40153)
KSB solenoid-operated	Delivery-quant. and breakaway char.:
valve volt: -	
3rd speed 1/min: 1000	- 1st speed 1/min: 2735
TD travel mm: 1,94,3	- KSB solenoid-operated
mm: -	- valve volt: 12.0
KSB solenoid-operated	Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)
valve volt: -	- 1000H.: (5,013,0)
4th speed 1/min: 800	- 2nd speed 1/min: 2575
TD travel mm: 0,91,7	- KSB solenoid-operated
mm: $(0,62,0)$	- valve volt: 12,0
KSB solencid-operated	- Del.quantity cm3/: 18,524,5 - 1000H.: -
valve volt: 12,0	- 1000H.: -
5th speed 1/min: 1000	- 3rd speed 1/min: 2300
TD travel mm: 2,02.4	- KSB solenoid-operated
mm: (1,52,9)	- valve volt: 12.0
KSB solenoid-operated	- valve volt: 12,0 - Del.quantity cm3/: 27,930,5
valve volt: 12,0	- 1000H.: (26,931,5)
6th speed 1/min: 2000	- 4th speed 1/min: 2000
TD travel mm: 6,27,0	- KSB solenoid-operated
mm: -	- valve volt: 12,0
KSB solenoid-operated	- Del.quantity cm3/: 27.129.7
valve volt: 12,0	- 1000H.: (26,130,7)
1000 12/0	- 5th speed 1/min: 1300
1st speed 1/min: 2300	- KSB solenoid-operated
TD travel mm: 7,58,3	- valve volt: 12,0
mm: (7,28,6)	- Del.quantity cm3/: 31.132.1
KSB solenoid-operated	- Del.quantity cm3/: 31/132/1 - 1000H.: (29/333/9)
valve volt: 12,0	- 6th speed 1/min: 700
Vacve Vocc. 12,0	- KSB solenoid-operated
Supply-pump pressure characteristic:	- valve volt: 12,0
odpocy paid pressure characterisere.	- Del.quantity cm3/: 24,527,5
1st speed 1/min: 800	- 1000H.: (23,029,0)
Supply-pump +	-
pressure bar: 3,44,0	- Zero delivery (stop):
KSB solenoid-operated	-
valve volt: 12,0	•
2nd speed 1/min: 1000 +	- Electr. shutoff:
Supply-pump +	-
pressure bar: 4,04,6	- Speed 1/min: 400
KSB solenoid-operated	- ELAB volt: -
valve volt: 12,0	- Del.quantity_cm3/: 0,03,0
3rd speed 1/min: 2300	- max. 1000H.: -
Supply-pump +	- INGA: 1000III.
pressure bar: 7,68,2	- Idle delivery:
KSB solenoid-operated	- Idea decivery.
valve volt: 12,0	- 1st speed 1/min: 400
Vacve Voce: 12,0	- KSB solenoid-operated
Overflow quantity at overflow valve:	- valve volt: 12,0
de over 1 com vacve.	- Del.quantity cm3/: 8,512,5
1st speed 1/min: 700	- 1000H.: (6,514,5)
KSB solenoid-operated	-
valve volt: 12,0	- Residual:
Oveflow : 4183	MOSTAGAC:
quantity cm3/10s: (2698)	- Speed 1/min: 750
2nd speed 1/min: 2300	- opecu izmin. 190
בות שאבבת ויווווווי בשטט ד	<del>-</del>

Del.quantity : 0,0...1,6 1000H.: -

KSB-Solenoid-operated valve Volt: 12,0

# Automatic starting fuel delivery:

1st speed 1/min: 400 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: -ind. 1000H: 25,0

1/min: 500 2nd speed KSB solenoid-operated volt: 12,0 valve Del.quantity cm3/: -max. 1000H: 32,5

#### Shutoff electromagnet:

Cut-in

min. voltage Rated voltage : 10,0 : 12,0

### Mounting and assembly dimensions:

Designation

: 3,2...3,4 : 5,3...5,7 : 0,5...0,9 K mm KF MS mm mm : 16,1...18,1 mm : 11,0...14,4 XK XL

#### Remarks:

Note inst. in remarks column

: OPE 1,7 B : 09.11.89 Test sheet Edition : 16.01.89 replaces Calibrating oil : ISO 4113

: VE 4/ 9F2300 R313-1 Injection pump : 0 460 494 230 Type number

Customer-specific information

Customer

: OPEL

Engine

: 17 YD

TEST BENCH REQUIREMENTS

Calibrating oil return temp. , C

with thermometer : 40...48 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening

pressure bar: 147...150

Test ini. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : -(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Setting value mm: 4,2...4,6 KSB solenoid-operated volt: 12,0 valve

Supply-pump pressure:

1/min: 1500 Setting value bar: 5,4...6,0 KSB solenoid-operated valve volt: 12,0

Full-load del. w/out charge press.:

1/min: 1300 Speed

Del.quantity cm3/ 1000H.: 31,1...32,1

KSB solenoid-operated volt: 12,0 cm3/: 2,5 1000H.: (2,5) valve Dispersion

Low-idle speed regulation:

1/min: 400

Del.quantity cm3/ 1000H.: 7,0...11,0

KSB solenoid-operated volt: 12,0 valve cm3/: 2,5 1000H.: (2,5) Dispersion

Full-load speed regulation:

Speed 1/min: 2575

Del.quantity cm3/

1000H: 18,5...24,5

KSB solenoid-operated volt: 12,0 valve

Start:

1/min: 100 Speed Del.quantity cm3/1000H.: 26,0 mind i KSB solenoid-operated volt: 12,0 valve

Load-dependent start of delivery:

1/min: 1500 Speed

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 300 1st speed TD travel mm: 0.8...3.2mm: -

KSB solenoid-operated valve volt: -1/min: 800 2nd speed

TD travel mm: 1,9...4,3mm: --

KSB solenoid-operated volt: -

valve 1/min: 1000 3rd speed

TD travel mm: 1,94,3	1	KSB solenoid-operated
mm: -	1	valve volt: 12,0
KSB solenoid-operated	Ł	Dol guantity cm3/: 7 0 11 0
	T	1000U . (5 0 17 0)
valve volt: -	Ť	Del.quantity cm3/: 7,011,0 1000H.: (5,013,0) 2nd speed 1/min: 2575
4th speed 1/min: 800	+	Zna speed 1/min: 2575
TD travel mm: 0,91,7	+	KSB solenoid-operated
mm: (0,62,0)	+	valve volt: 12,0
KSB solenoid-operated	+	Del.quantity cm3/: 18,524,5 1000H.: -
valve volt: 12,0		1000H · -
5th speed 1/mine 1500	- T -	3rd speed 1/min: 2300
5th speed 1/min: 1500		
TD travel mm: 4,24,6 mm: (3,94,9)	+	KSB solenoid-operated
mm: (3,94,9)	+	valve volt: 12,0
KSB solenoid-operated	+	Del.quantity cm3/: 27,930,5
valve volt: 12,0	+	1000H.: (27,231,2)
6th speed 1/min: 2000	<b>-</b>	4th speed 1/min: 2000
TD travel mm: 6,27,0		KSB solenoid-operated
mm: -	1 '	valve val+: 12 0
	T.	valve volt: 12,0 Del.quantity cm3/: 27,129,7
KSB solenoid-operated	<b>†</b>	Deliquantity cm5/: 2/,129,/
valve volt: 12,0	+	1000H.: -
	+ :	5th speed 1/min: 1300
1st speed 1/min: 2300	+ 1	KSB solenoid-operated
TD travel mm: 7,58,3	1	valve volt: 12,0
mm: (7,28,6)	$\perp$	Del quantity cm3/: 31 1 32 1
	T	Del.quantity cm3/: 31,132,1 1000H.: (29,633,6)
KSB solenoid-operated	Ť	/
valve volt: 12,0	+ !	6th speed 1/min: 700
	+ 1	KSB solenoid-operated
Supply-pump pressure characteristic:	+	valve volt: 12,0
	- ∔ :	Del.guantity cm3/: 24,527,5
1st speed 1/min: 800	1	Del.quantity cm3/: 24,527,5 1000H.: (23,728,3)
	Ŧ	100011 (25/120/5/
Supply-pump	T	
	- 1	Toma dalinama (atam).
pressure bar: 3,44,0	+ :	Zero delivery (stop):
KSB solenoid-operated	+ ;	Zero delivery (stop):
KSB solenoid-operated valve volt: 12.0	+ ;	Zero delivery (stop):
KSB solenoid-operated valve volt: 12.0	‡	Zero delivery (stop):  Electr. shutoff:
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500	‡	·
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump	†	Electr. shutoff:
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0	† † † †	Electr. shutoff: Speed 1/min: 400
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated	+++++	Electr. shutoff:  Speed 1/min: 400 ELAB volt: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  Speed 1/min: 400 ELAB volt: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2	<del>+++++++++++++++++++++++++++++++++++++</del>	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0	<del>+ + + + + + + + + + + + + + + + + + + </del>	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated	<del>+ + + + + + + + + + + + + + + + + + + </del>	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:	<del>+ + + + + + + + + + + + + + + + + + + </del>	Electr. shutoff:  Speed 1/min: 400  ELAB volt: -  Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700	+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-	Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:		Electr. shutoff:  Speed 1/min: 400  ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated		Electr. shutoff:  Speed 1/min: 400  ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0		Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0) 2nd speed 1/min: 500 KSB solenoid-operated
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183		Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0) 2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698)		Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0 Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300		Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0) 2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0 Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated VSB solenoid-operated	<del>+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-</del>	Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0  KSB solenoid-operated valve volt: 12,0	<del>+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-</del>	Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0 Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0 Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated VSB solenoid-operated	<del>+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-</del>	Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0 Overflow : 55138	<del>+++++++++++++++++++++++++++++++++++++</del>	Electr. shutoff:  Speed 1/min: 400  ELAB volt: - Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -  Automatic starting fuel delivery:
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0  KSB solenoid-operated valve volt: 12,0		Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 400
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0  Overflow : 55138 quantity cm3/10s: (40153)		Electr. shutoff:  Speed 1/min: 400 ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 400 KSB solenoid-operated
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0 Overflow : 55138	#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-	Electr. shutoff:  Speed 1/min: 400  ELAB volt: - Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 400  KSB solenoid-operated valve volt: 12,0  VSB solenoid-operated valve volt: 12,0
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0  Overflow : 55138 quantity cm3/10s: (40153)  Delivery-quant. and breakaway char.:	#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-	Electr. shutoff:  Speed 1/min: 400  ELAB volt: - Del.quantity cm3/: 0,03,0 max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 400  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: -  Del.quantity cm3/: -
KSB solenoid-operated valve volt: 12,0 2nd speed 1/min: 1500 Supply-pump pressure bar: 5,46,0 KSB solenoid-operated valve volt: 12,0 3rd speed 1/min: 2300 Supply-pump pressure bar: 7,68,2 KSB solenoid-operated valve volt: 12,0  Overflow quantity at overflow valve:  1st speed 1/min: 700 KSB solenoid-operated valve volt: 12,0  Oveflow : 4183 quantity cm3/10s: (2698) 2nd speed 1/min: 2300 KSB solenoid-operated valve volt: 12,0  Overflow : 55138 quantity cm3/10s: (40153)	#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-#-	Electr. shutoff:  Speed 1/min: 400  ELAB volt: - Del.quantity cm3/: 0,03,0  max. 1000H.: -  Idle delivery:  1st speed 1/min: 425  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 7,011,0 1000H.: (5,013,0)  2nd speed 1/min: 500  KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 2,58,5 1000H.: -  Automatic starting fuel delivery:  1st speed 1/min: 400  KSB solenoid-operated valve volt: 12,0  VSB solenoid-operated valve volt: 12,0

2nd speed 1/min: 500 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: max. 1000H : 25,5

# Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

# Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4 KF mm : 5,3...5,7 MS mm : 0,5...0,9

### Remarks:

Note inst. in remarks column

Test sheet : PEU 1,9 K4 : 06.11.89 Edition

replaces

: ISO 4113 Calibrating oil

: VE 4/ 9F2300 R272-2 Injection pump

: 0 460 494 240 Type number

Customer-specific information Customer : PEUGEOT

Engine : XUD9A

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp. ., C with thermometer : 40...48 electronically

Inlet press., bar: 0.35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening

bar: 130...133 pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 x Length mm: 450

Start of delivery e mm:-(from BDC):-Prestroke

Indicator setting: Piston stroke mm: 0.3 Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1250 Speed Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 1250 Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

1/min: 1250 Speed

Del.quantity cm3/

1000H.: 30,0...31,0 cm3/: 2,5

Dispersion

1000H.: -

Low-idle speed regulation:

Speed 1/min: 375

Del.quantity cm3/ 1000H.: 8,0...10,0

cm3/: 2,5 Dispersion 1009H.: -

Residual-Delivery Setting 1/min: 550 Speed

Del.quantity cm3/

1000H .: 0,0...6,0

Full-load speed regulation:

1/min: 2500 Speed

Del.quantity cm3/

1000H: 19,0...25,0

Start:

1/min: 100 Speed Del.quantity

cm3/1000H.: 45,0 mind

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 0,2...1,0 mm: (0,0...1,3) TD travel

1/min: 1250 2nd speed

TD travel

mm: 2,6...3,0 mm: (2,3...3,3) 1/min: 2000

3rd speed TD travel

mm: 6,0...6,8 mm: (5,7...7,1)

Supply-pump ressure characteristic:

1/min: 800 1st speed

Supply-pump

bar: 2,6...3,2 pressure 1/min: 1250 2nd speed

Supply-pump bar: 3,9...4,5 pressure 3rd speed 1/min: 2000 Supply-pump bar: 5,9...6,5 pressure Overflow quantity at overflow valve: 1/min: 500 1st speed Oveflow : 41...83 cm3/10s: (26...98) 1/min: 2250 : 55...138 quantity 2nd speed Overflow quantity cm3/10s: (40...153) Delivery-quant. and breakaway char.: 1/min: 2650 cm3/: 0,0...10,0 1st speed Del.quantity 1000H.: -1/min: 2500 2nd speed cm3/: 19,0...25,0 Del.quantity 1000H.: (18,0...26,0) 3rd speed 1/min: 2250
Del.quantity cm3/: 31,5...34,5
1000H.: (30,7...35,3) 1/min: 1250 4th speed Del.quantity cm3/: 30,0...31,0 1000H.: (28,2...32,8) 1/min: 800 5th speed Del.quantity cm3/: 30,7...33,7 1000H.: (29,7...34,7) 6th speed 1/min: 500 Del.quantity cm3/: 30,7...33,7 1000H.: (29,7...34,7) Zero delivery (stop): Idle delivery: 1st speed 1/min: 375 Del.quantity cm3/: 8,0...10,0 1000H.: (6,0...12,0) High Idle: 1/min: 470 Speed Del.quantity cm3/: 8,0...10,0 1000H.: (6,0...12,0) Residual: 1/min: 550 Speed : 2,5...3,5 Del.quantity 1000H.: (0,0...6,0) Automatic starting fuel delivery:

Del.quantity cm3/: ind. 1000H: 40,0

2nd speed 1/min: 300
Del.quantity cm3/: max. 1000H: 35,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation
K mm : 3,2...3,4
KF mm : 5,3...5,7
MS mm : 1,2...1,6

Remarks:

K28

1st speed

1/min: 200

Note inst. in remarks column

: FIA 1,7 P11 : 06.11.89 Test sheet Edition : 19.07.89 replaces : ISO 4113 Calibrating oil

: VE 4/ 9F2300 256-2 Injection pump : 0 460 494 253 Type number

Customer Part-No. :

Customer-specific information Customer : FIAT-AUTO

: M705 LA 19.0 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. ,C

with thermometer: 40...48 : 42...50 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 022 assembly

Openina

bar: 130...133 pressure

Test ini. tubing : 1 680 750 073

Outside diameter : 6 x Wall thickness : 2 mm: 450 x Length

Start of delivery Prestroke mm: — (from BDC): -

Indicator setting: Piston stroke mm: 1.0 Outlet : A

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Speed Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1500 Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

1/min: 1500 Speed

Del.quantity cm3/

1000H.: 28,0...29,0 cm3/: 2,5

Dispersion 1000H.: -

Low-idle speed regulation:

1/min: 390 Speed

Del.quantity cm3/ 1009H.: 10,0...14,0 Dispersion cm3/: 2,5 1000H.: (2,5)

Full-load speed regulation:

1/min: 2500 Speed

Del.quantity cm3/

1000H: 18,5...24,5

Start:

Speed 1/min: 100 Del.quantity cm3/1000H.: 55,0 mind

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 800 1st speed

mm: 1,1...1,9 mm: (0,8...2,2) TD travel

1/min: 1500 2nd speed

mm: 4,4...4,8 mm: (3,9...5,3) TD travel

1/min: 2000 3rd speed TD travel

4th speed

mm: 6,6...7,4 mm: (6,2...7,8) 1/min: 2300 mm: 7,8...8,6 TD travel mm: (7,5...8,9)

Supply-pump pressure characteristic:

1/min: 600 1st speed

Supply-pump

bar: 3,1...3,7 pressure

Del.quantity cm3/: 0,0...3,0 1000H.: -1/min: 1500 2nd speed Supply-pump bar: 5,3...5,9 1/min: 2300 pressure Automatic starting fuel delivery: 3rd speed Supply-pump 1/min: 300 bar: 7,1...7,7 1st speed pressure Del.quantity cm3/: -1000H: 48,0 Overflow quantity at overflow valve: ind. 1/min: 400 1/min: 600 2nd speed 1st speed : 41...83 Del.quantity cm3/: -Oveflow cm3/10s: (26...98) 1000H: 45,0 quantity 1/min: 2300 2nd speed : 55...138 Overflow Shutoff electromagnet: quantity cm3/10s: (40...153) Cut-in : 10,0 Delivery-quant. and breakaway char .: min. voltage : 12,0 Rated voltage 1st speed 1/min: 2900 cm3/: 0,0...6,0 Mounting and assembly dimensions: Del.quantity 1000H.: -1/min: 2650 Designation 2nd speed Del.quantity cm3/: 4,5...11,5 5,6...6,0 K mm 1000H.: (3,0...11,0) KF 1/min: 2500 : 1,6...2,0 MS 3rd speed mm Del.quantity cm3/: 18,5...24,5 1000H.: (17,5...25,5) 4th speed 1/min: 2300 Del.quantity cm3/: 29,3...31,7 : 17,0...19,0 XK mm : 9,8...13,2 XL mm Del.quantity cm3/: 27/3...32/8) Remarks: : 1/min: 1500 5th speed Del.quantity cm3/: 28,u...27,0 1000H.: (26,2...30,8) 1/min: 1000 cm3/: 27,8...30,2 6th speed Del.quantity cm3/: 2/,0...31,3) 1/min: 600 7th speed Del.quantity cm3/: 28,9...31,9 1000H.: (27,4...33,4) Zero delivery (stop): Electr. shutoff: 1/min: 390 Speed ELAB volt: -Del.quantity cm3/: 0,0...3,0 1000H.: max. Idle delivery: 1st speed 1/min: 390 Del.quantity cm3/: 10,0..14,0 1000H.: (7,0...17,0) 1/min: 440 2nd speed Del.quantity cm3/: 0,0...6,0 1000H.: (0,0...8,5) 3rd speed 1/min: 500

Note inst. in remarks column

Test sheet : VWW 2,0 K1 : 06.11.89 Edition : 03.03.89 replaces : ISO 4113 Calibrating oil

: VE 5/ 9F2250 L245 Injection pump : 0 460 495 001 Type number

Customer Part-No. :

Customer-specific information

Customer

Engine : 153T-LLK

TEST BENCH REQUIREMENTS

Calibrating-oil return temp. \_, C

with thermometer: 40...48 electronically

Inlet press., bar: 0,35

Calibrating nozzle-holder

: 1 688 901 000 assembly

Opening |

bar: 147...150 pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery Prestroke mm : --(from BDC): -

Injection pump setting values Test specifications in parentheses

Timing-device travel:

1/min: 1500 Charge press. hPa: 750 Setting value mm: 3,0...3,4 KSB solenoid-operated

valve volt: 12,0

Supply-pump pressure:

1/min: 1500 Speed Charge press. hPa: 750 Setting value bar: 6,0...6,6 KSB solenoid-operated volt: 12,0 valve

Full-load del. with charge press.:

1/min: 1500 Speed Del.quantity cm3/

1000H.: 42,7...43,7

KSB solenoid-operated volt: 12,0 valve cm3/: 2,5 1000H: (3,0) Dispersion

Full-load del. w/out charge press.:

Speed 1/min : 700 Del.quantity cm3/ 1000H.: 27,0...28,0

KSB solenoid-operated volt: 12,0 valve

Low-idle speed regulation:

1/min: 390

Del.quantity cm3/ 1000H.: 10,0...12,0

KSB solenoid-operated volt: 12,0 cm3/: 2,5 1000H.: (3,0) valve Dispersion

Residual-Delivery Setting Speed 1/min: 540 Del.quantity cm3/ 1000H.: 2,5...3,5

KSB-Solenoid-Operated valve Volt : 12.0

Full-load speed regulation:

Speed 1/min: 2525

Del.quantity cm3/ 1000H: 16,0...20,0

KSB solenoid-operated volt: 12,0 valve

Start:

1/min: 100 Speed : 37,0...48,0 Del.quantity cm3/1000H.: mind KSB solenoid-operated valve volt: 12,0

Inspection pump test specifications Test specifications in parentheses

Timing-device characteristic:

	+ 0	veflow		4183
	+ _	quantity cm	3/10s:	(2698)
1st speed 1/min: 500	+ 3	ind speed	1/min:	2250
Charge press. hPa: 750	+ 9	harge press.	hPa:	750
TD travel mm: 2,32,7 mm: 1,53,5	† K	(SB solenoid-	operate	ed
mm: 1,53,5		valve	volt:	12,0
KSB solenoid-operated	† 0	verflow		55138
valve volt: -	†	quantity cm	B/TUS:	(40755)
2nd speed 1/min: 1000	† ,	ر مراجع المراجع المراجع المراجع المراجع	امسم تد	baseliniai oboni
Charge press. hPa: 750	7 "	etivery—quan	it. and	breakaway char.:
TD travel mm: 0,81,6	† 1	at apped	1/min.	0EU
mn: (0,51,9)		st speed		
KSB solenoid-operated		Charge-air pr	hPa:	750 TEN
valve volt: 12,0		point		
3rd speed 1/min: 1500		(SB solenoid- valve	volt:	
Charge press. hPa: 750	Ι'n	valve nel guantity	cm3/.	33 5 34 5
TD travel mm: 3,03,4 mm: (1,53,9)	Ι	et.quarterty 1	UUUH .	33,534,5 (31,037,0) 2525
KSB solenoid-operated	Ι,	had sneed '	1/min.	2525
valve volt: 12,0	1 7	harge press.	hPa	750
4th speed 1/min: 2250		(SB solenoid-		
Charge press. hPa: 750		valve		
TD travel mm: 6,06,8	1 n	el quantity	cm3/:	16.020.0
mm: (5,77.1)	1	1	000H.:	(14.0,22.0)
KSB solenoid-operated	<del>↓</del> 3	rd speed	1/min:	16,020,0 (14,022,0) 2425
valve volt: 12,0	1 0	harge press.	hPa:	750
Vac-10		SB solenoid-		
Supply-pump pressure characteristic:		valve		
supply party product or and according	↓ D	el quantity	cm3/:	25,5,35,5
1st speed 1/min: 500		1	000H.:	(24,536,5)
Charge press. hPa: 750	1 4	th speed	1/min:	2250
Supply-pump		harge press.		
pressure bar: 5,26,4		SB šolenoid-		
KSB solenoid-operated	+	valve	volt:	12,0
valve volt: -	+ D	el.quantity	cm3/:	37,539,5 (36,340,7)
2nd speed 1/min: 700	+	1	000H.:	(36,340,7)
Charge press. hPa: 750	+ 5	th speed	1/min:	1500
Supply-pump	+ c	harge press.	hPa:	750
pressure bar: 4,14,7	<del> </del>	ISB solenoid-	operate	ed
KSB solenoid-operated	+	valve	volt:	12,0
valve volt: 12,0	+ D	el.quantity	_cm3/:	42,743,7
3rd speed 1/min: <u>15</u> 00	+ .		000H.:	(41,045,4)
Charge press. hPa: 750			1/min:	
Supply-pump	+ C	harge press.	hPa:	350
pressure bar: 6,06,6		(SB solenoid-	operate	ed
KSB solenoid-operated	† .	valve	volt:	12,0
valve volt: 12,0	† D	el.quantity	cm5/:	33,534,5
4th speed 1/min: 2250	† _	- T	OUUH.:	(31,037,0)
Charge press. hPa: 750			1/min:	
Supply-pump	† :	harge press.	hPa:	
pressure bar: 7,78,3		SB solenoid-	operate	10 42 0
KSB solenoid-operated	t ,	valve	volt:	16,U 27,0, 28,0
valve volt: 12,0	T	el.quantity	1,000 t	(2/, 5 70 5)
A complete an amendada and a complete and a complet	T .		1/min	(24,530,5)
Overflow quantity at overflow valve:			1/min:	
1-4		harge press.		
1st speed 1/min: 700	T	SB solenoid-	operate	10 12 A
Charge press. hPa: -	T ~	valve el.quantity	Cm2/.	77 0 /0 0
KSB solenoid-operated	Ι	et.quantity	10001:	(35,541,5)
valve volt: 12,0	T		IUUUT.	しいファン・・・サミァファ

9th speed 1/min: 500 Charge press. hPa: -KSB solenoid-operated volt: 12,0 valve

cm3/: 24,5...29,5 Del.quantity 1000H: (22,0...32,0)

Zero delivery (stop):

Electr. shutoff:

1/min: 415 Speed ELAB volt: -

Del.quantity cm3/: 0,0...3,0 max. 1000H.: -

Idle delivery:

1st speed 1/min: 390 KSB solenoid-operated valve volt: 12,0 Del.quantity cm3/: 10,0..12,0 1000H.: (5,5...16,5)

1/min: 415 2nd speed

KSB solenoid-operated

valve volt: 12,0 Del.quantity cm3/: 6,0...10,0 1000H.: (2,5...13,5)

Residual:

Speed

1/min: 490 : 3,3...5,3 1000H.: (0,8...7,8) Del.quantity

KSB-Solenoid-operated Volt: 12,0 valve

Automatic starting fuel delivery:

1/min: 190 3rd speed KSB solenoid-operated valve

volt: 12,0 cm3/: 35,0...85,0 Del.quantity

1000H: -

1/mi: 390 4th speed KSB solenoid-operated Volt: 12,0 cm3/: 15,0...35,0 valve

Del.quantity

1000: -

Shutoff electromagnet:

Cut-in

min. voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

mm : K1 K KF mm

MS mm

1,6...2,0 : 1,3 : 17,0...19,0 SVS max. mm XK mm

: 10,3...13,7 XL mm

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

L05

Note remarks

Test sheet

Edition : 06.10.89

Replaces

Test oil : ISO-4113

Combination no. : 0 400 064 034

Injection pump

Pump designation : PES4M55C12ORS106 EP type number : 0 410 054 986

Governor

Governor design. : RSV350...1750M0B129

Governer no. : 0 420 035 078

Customer—spec. information Customer : MB-NFZ

Engine : 0M616/932

1st version kW : 44.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 012

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...34

Prestroke mm : 1.70...1.80 : (1.65...1.85)

Rack travel in mm: 18.50...21.50

Firing order : 1-3-4-

Phasing : 0-90-180-270

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1730

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 3.8...3.9

100 s: (3.7...4.0)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 350.0 Rack travel in mm : 6.8...7.0 Del.quantity cm3/: 0.6...0.8

100 s: (0.5...0.8)

Spread cm3 : 0.1 100 s: (0.1)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3

Speed rpm: 800

Rack travel in mm: 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1730

Del.quantity : 38.5...39.5 1000 : (37.5...40.5)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 52...60

Setting point:

Speed rpm: 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 12.20

Speed rpm : 1760...1780

2nd rack travel in: 4.00

Speed rpm : 1885...1915

4th rack travel in: 1970

Speed rpm : 0.30...1.70

LOW IDLE 1 Control lever position degrees: 14...22 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm: 6.4 Testing: Speed : 100 rpm Minimum rack trave: 20.30 Speed rpm : 350 Rack travel in mm : 6.30...6.50 Rack travel in mm: 2.00 Speed rpm : 770...830 : 900 Speed rom Maximum rack trave: 1.50 TORQUE CONTROL Torque control curve - 1st version rpm : 1730 1st speed Rack travel in m: 13.10...13.20 2nd speed rpm : 1100 Rack travel in m: 13.70...13.90 3rd speed rpm : 600 Rack travel in m: 14.10...14.30 FUEL DELIVERY CHARACTERISTICS 1st version : 1100 Speed rpm Del.quantity cm3/: 37.5...39.5 1000 s: (36.5...40.5) Spread cm3 : 2.501000 s: (3.) : 600 Speed rpm Del.quantity cm3/: 38.0...40.0 1000 s: (37.0...41.0) cm3 : 2.50Spread 1000 s: (3.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.20 : 1760...1780 Speed rpm STARTING FUEL DELIVERY : 100 Speed rom Del.quantity cm3/: 53.0...0.0 1000 s: (50.0...0.0) Rack travel in mm: 20.30...0.00

Speed rpm : 350
Rack travel in mm : 6.80...7.00
Del.quantity cm3/: 6.0...8.0
1000 s: (5.5...8.5)
Spread cm3 : 1.00
1000 s: (1.50)

Remarks:

•

L07

LOW IDLE

Note remarks

Test sheet : VOL 7,1 d : 09.11.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 505

Injection pump

Pump designation : PE6P110A320RS483 EP type number : 0 411 816 159

Governor

Governor design. : RQV250...1200PA918 Governer no. : 0 421 813 772

Customer-spec. information : VOLVO Customer

: TD71F Engine

1st version kW : 162.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 12.7...12.9

100 s: (12.4...13.2)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.3)

cm3 : 0.3 Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.10...1.30 travel mm rpm : 380 2nd speed

: 2.30...2.60 travel mm

3rd speed rpm : 500 travel mm : 2.90...3.30 4th speed rpm : 1260

: 7.70...7.90 travel mm

rpm : 1400 5th speed

: 9.00...9.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1330 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 127.0...129.0 1000 : (124.0...132.0)

1.08

cm3 : 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 54...62

Testing:

1st rack travel in: 11.30 Speed rpm : 1240...1250

2nd rack travel in: 4.00

rpm : 1380...1410 Speed

4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 6...14

Testina:

Speed : 100 rpm Minimum rack trave: 6.80 rpm : 250

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 250...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 12.30...12.40 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.30

2nd pressure hPa : 570

Rack travel in m: 12.10...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/: 85.0...88.0 1000 s: (82.0...91.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.30

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm: 250
Rack travel in mm: 5.30...5.50
Del.quantity cm3/: 16.0...20.0
1000 s: (13.0...23.0)

cm3 : 3.00 Spread

1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

## Note remarks

: VOL 7,1 d 1 Test sheet : 09.11.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 506

Injection pump

Pump designation: PE6P110A320RS483-1 EP type number : 0 411 816 160

Governor

Governor design. : RQV250...1200PA918-1

: 0 421 813 773 Governer no.

Customer-spec. information : VOLVO Customer

: TD71FS Engine

1st version kW : 180.0 Rated speed : 2400

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.10...13.20

Del.guantity cm3/: 14.2...14.4

100 s: (13.9...14.7)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.3) cm3 : 0.3

Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.10...1.30 travel mm rpm : 380 2nd speed

travel mm : 2.30...2.60 3rd speed

rpm : 500 : 2.90...3.30 travel mm rpm : 1260 4th speed

: 7.70...7.90 travel mm

rpm : 1400 5th speed

travel mm : 9.00...9.30

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1330 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1200

Del.quantity : 142.0...144.0 1000 : (139.0...147.0)

cm3 : 4.00Spread

1000 : (7.50)

## RATED SPEED

1st version Control lever

position degrees: 54...62

Testina:

1st rack travel in: 12.10

Speed rpm : 1240...1250 2nd rack travel in: 4.00 Speed rpm : 1385...1415

4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 6...14

Testing:

: 100 Speed rpm Minimum rack trave: 6.80 Speed rpm

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 250...450 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm hPa : 1200 Pressure

: 13.10...13.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.30

2nd pressure hPa : 710

Rack travel in m: 12.20...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 1000

Del.quantity cm3/: 134.0...138.0 1000 s: (131.0...141.0)

Aneroid pressure h: -

: 700 rpm

Del.quantity cm3/: 85.0...88.0 1000 s: (82.0...91.0)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.10

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...200.0 1000 s: (166.0...204.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 16.0...20.0 1000 s: (13.0...23.0)

cm3 : 3.00Spread

1000 s: (6.00)

# Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Note remarks

Test sheet : VOL 10,0 z Edition : 09.11.89

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 529

Injection pump

Pump designation : PE6P12OA32ORS3186 : 0 411 826 756 EP type number

Governor

Governor design. : RQV250..1025PA921-4

Governer no. : 0 421 813 787

Customer-spec. information Customer : VOLVO

Engine : TD102F

1st version kW : 220.0 : 2050 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.60...2.70 : (2.55...2.75) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 19.7...19.9

100 s: (19.4...20.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.02nd speed

Rack travel in mm : 4.2...4.4 Del.quantity cm3/ : 1.7...2.2

100 s: (1.4...2.4)

cm3 : 0.5Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.20...1.30 travel mm rpm : 430 2nd speed

: 3.50...3.80 travel mm

rpm : 700 3rd speed

: 6.40...6.60 travel mm

rpm : 900 4th speed

: 6.40...6.60 travel mm

rpm : 1080 5th speed

travel mm : 8.30...8.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1080

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 1000

: 197.0...199.0 Del.quantity 1000 : (194.0...202.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 58...66 Testing: 1st rack travel in: 10.40 rpm : 1055...1065 Speed 2nd rack travel in: 4.00 rpm : 1110...1140 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 4...12 Testing: rpm : 100 Speed Minimum rack trave: 5.70 rpm Rack travel in mm : 4.20...4.40 CONSTANT REGULATION rpm : 250...350 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 hPa : 1000 Pressure : 11.40...11.50 Rack travel mm Measurement 1/min : 500Speed 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 80 Rack travel in m: 9.00...9.10 3rd pressure hPa : 400 Rack travel in m: 10.90...11.10 FUEL DELIVERY CHARACTERISTICS

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.40 Speed rpm : 1055...1065

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.20...4.40 Del.quantity cm3/: 17.0...22.0 1000 s: (14.5...24.5)

cm3 : 5.00

Spread 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90

Speed

1st version

Aneroid pressure h: -

rpm\_ : 700

1000 s: (140.0...148.0)

Del.quantity cm3/: 143.0...145.0

#### Note remarks

: VOL 7,1 d 2 Test sheet : 01.12.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 534

Injection pump

Pump designation : PE6P110A320RS483-4 EP type number : 0 411 816 172

Governor

Governor design. : RQV250...1200PA918-2

Governer no. : 0 421 813 774

Customer-spec. information : VOLVO Customer

Engine : TD71FD

1st version kW : 158.0 : 2400 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm

: (2.95...3.15) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - \dots : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 12.0...12.2

100 s: (11.7...12.5)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.3) cm3 : 0.3

Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.10...1.30 travel mm rpm : 380 2nd speed

: 2.30...2.60 travel mm

rpm : 500 : 2.90...3.30 3rd speed travel mm

4th speed rpm: 1260 : 7.70...7.90 travel mm

rpm : 1400 5th speed

: 9.00...9.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1330

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 700 Speed Aneroid pressure h: 900

Del.quantity : 120.0...122.0 1000 : (117.0...125.0)

cm3 : 4.00 1000 : (7.50) Spread

RATED SPEED

1st version Control lever

position degrees: 54...62

Testing:

1st rack travel in: 11.00 rpm : 1260...1270 Speed

2nd rack travel in: 4.00

Speed rpm: 1390...1420 4th rack travel in: 1550

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 6...14

Testing:

: 100 Speed rpm Minimum rack trave: 6.80 : 250 Speed rpm

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 250...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 12.00...12.10 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.30 2nd pressure hPa : 560 Rack travel in m: 11.80...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 85.0...88.0

1000 s: (82.0...91.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1260...1270 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 170.0...200.0 1000 s: (166.0...204.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Note remarks

: ENA 12,0 a Test sheet Edition : 01.12.89 : 29.3.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 846 548

Injection pump

Pump designation : PE6P120A320RS257 : 0 411 826 075 EP type number

Governor

Governor design. : RQ250/1100PA877 : 0 421 801 409 Governer no.

Customer-spec. information Customer : ENASA

Engine : 96T1AZ

1st version kW : 228.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 18.4...18.6

100 s: (18.1...18.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 550 Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 900

: 184.0...186.0 Del.quantity

1000 : (181.0...189.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm : 550 Speed Rack travel in mm: 16.0

Testing:

1st rack travel in: 9.60

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

rpm : 1190...1220 Speed

4th rack travel in: 1300

rom : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rom Rack travel in mm: 5.6

Testina:

Speed rpm Minimum rack trave: 7.10 Speed rpm : 250

Rack travel in mm : 5.50...5.70

Rack travel in mm: 2.00 : 340...380 Speed rom

TORQUE CONTROL

Dimension a mm : 0.20

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 10.90...11.00

rpm : 1080 2nd speed

Rack travel in m: 10.60...10.80 rd speed rpm : 720 Rack travel in m: 10.70...10.90

3rd speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 rpm : 500 hPa : 900 Speed Pressure

: 10.90...11.00 Rack travel mm

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 340

Rack travel in m: 9.30...9.40
3rd pressure hPa : 470

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 1080

Del.quantity cm3/: 198.0...204.0

1000 s: (195.0...207.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 130.0...150.0

1000 s: (126.0...154.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

Note remarks

: ENA 11,9 a1 Test sheet : 01.12.89 Edition : 24.2.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 846 550

Injection pump

Pump designation: PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. : RQV250...1050PA808

Governer no. : 0 421 813 553

Customer-spec. information : ENASA Customer

: 96 T1 CX Engine

: 228.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1030 1st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm rpm : 350

2nd speed

: 1.90...2.50 travel mm

rpm : 700 3rd speed

: 4.50...5.10 travel mm

rpm : 1095 4th speed

: 8.00...8.20 travel mm

rpm : 1185 5th speed

: 9.00...9.40 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1030Speed Aneroid pressure h: 900

Del.quantity : 209.0...211.0 1000 : (206.0...214.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 48...56

Testina:

1st rack travel in: 9.90

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1160...1190 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 13...21

Testing:

: 100 Speed rom Minimum rack trave: 7.20 rom

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 250...430 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 man hPa : 900 Pressure

Rack travel mm : 10.90...11.00

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.30...8.70

2nd pressure hPa : 510
Rack travel in m: 10.40...10.50
3rd pressure hPa : 300
Rack travel in m: 9.20...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 650

Del.quantity cm3/: 187.0...193.0 1000 s: (184.0...196.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 119.0...121.0

1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Rack travel in mm: 19.50...21.00

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

: RVI 9,8 h Test sheet : 01.12.89 Edition : 30.9.88 Replaces : ISO-4113 Test oil

Combination no. : 0 401 846 561

Injection pump

Pump designation : PE6P120A320RS519 EP type number : 0 411 826 145

Governor

Governor design. : RQ275/1050PA899 : 0 421 801 460 Governer no.

Customer-spec. information Customer : RVI

Engine : MIHS 06.20.45

: 185.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test Lines

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)
Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - . . : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 1050 1st speed

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 16.7...16.9

100 s: (16.4...17.2)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 275.0
Rack travel in mm : 5.40...5.80
Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

Aneroid pressure h: 700

: 167.0...169.0 Del.quantity 1000 : (164.0...172.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm Rack travel in mm: 20.0

Testina:

1st rack travel in: 10.00

rpm : 1110...1125 Speed 2nd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring : 275 rpm Rack travel in mm: 5.6 Testina: Speed : 200 rpm Minimum rack trave: 7.30 rpm : 275 Speed Rack travel in mm : 5.40...5.80 Rack travel in mm : 2.00 : 275...315 Speed rpm Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 700 Pressure : 11.00...11.10 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.60...9.80 2nd pressure hPa : 260 Rack travel in m: 10.60...10.70 3rd pressure hPa : 220 Rack travel in m: 9.90...10.10 START CUT-OUT Speed 1/min: 195 (215) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 750 Speed rpm Del.quantity cm3/: 159.0...165.0 1000 s: (156.0...168.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 104.0...106.0 1000 s: (101.0...109.0)

1mm rack travel less than full load rack tr: 10.00 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0) LOW IDLE Speed Rack travel in mm: -5.20...-5.60 Del.quantity cm3/: 13.0...19.0 1000 s: (10.0...22.0) Spread Remarks: APPLICATION **Omnibus** 

rpm : 1110...1125

: 275

cm3 : 8.00

1000 s: (12.00)

rpm

BREAKAWAY

1st version

L21

: 4.00...4.10 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.95...4.15) Rack travel in mm : 9.00...12.00 Note remarks : 6-3-5-2-4-1 Firing order : MB 11,0 c 5 : 01.12.89 Test sheet Edition : 28.6.89 Replaces : ISO-4113 : 0-45-120-165-240-285 Phasing Test oil Combination no. : 0 401 846 749 Injection pump Time to cyl. no. : 6 Pump designation : PE6P110A320LS3805-10 : 0 411 816 740 BASIC SETTING EP type number Governor Governor design. : RQ300/1150PA187-6 1st speed rpm: 750 : 0 421 801 155 Governer no. Rack travel in mm : 11.70...11.80 Customer-spec. information Del.quantity cm3/: 11.4...11.6 Customer : DAIMLER-BENZ 100 s: (11.1...11.9) : 0M421 Engine cm3 : 0.4: 159.0 Spread 1st version kW : 2300 Rated speed 100 s: (0.7) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 7.8...8.0 Test oil Del.quantity cm3/: 1.2...1.8 inlet temp. , C : 38...42 100 s: (0.9...2.0) cm3 : 0.4 100 s: (0.7) Overflow valve Spread : 1 417 413 025 GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Degree: -1 Overflow rpm : 650 quantity min. 1/h: 100...120 Speed Rack travel in mm : 12.80...13.60 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly 1st version **Opening** pressure, bar : 172...175 Speed rpm : 750 : 114.0...116.0 Del.quantity 1000 : (111.0...119.0) : 4.00 Test Lines : 1 680 750 015 Spread cm3 1000 : (7.00)Outside diameter RATED SPEED x Wall thickness : 6.00x1.50x600 x Length mm 1st version (A) Injection pump setting values Insp. values in parentheses Setting point: Set equal delivery quant. rpm Rack travel in mm: 13.2 per values

Testing:

1st rack travel in: 10.70 Speed rpm : 1190...1200

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

2nd rack travel in: 4.00 Speed rpm : 1235...1265 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 7.9 Testina: : 100 Speed rpm Minimum rack trave: 9.50 : 300 Speed rpm Rack travel in mm : 7.80...8.00 Rack travel in mm : 2.00 rpm : 410...440 Speed FUEL DELIVERY CHARACTERISTICS 1st version : 1150 Speed rpm Del.quantity cm3/: 132.0...136.0 1000 s: (129.0...139.0) cm3 : 5.00 Spread 1000 s: (8.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 Speed rpm : 1190...1200 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) Remarks:

Note remarks

Test sheet : MB 11,0 e 5 : 12.12.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 818

Injection pump

Pump designation : PE6P120A320LS3810-10

: 0 411 826 734 EP type number

Governor

Governor design. : RQV350...1150PA720-1

: 0 421 813 539 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M421A Engine

1st version kW : 184.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6,00X1,50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15)
Rack travel in mm : 9.00...12.00

: 6-3-5-2-4-1 Firing order

: 0-45-120-165-240-285 Phasing

Tolerance + - ... 0,50 (0,75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350

Rack travel in mm : 4.90...5.10

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1250

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

Aneroid pressure h: 700

Del.quantity : 130.0...163.0)

: 5.0 Spread cm3

1000 : (9.0)

RATED SPEED

1st version

Control Lever

position degrees: 58...66

Testina:

1st rack travel in: 9.70

rpm : 1175...1185 Speed 2nd rack travel in: 4.00 rpm : 1260...1290 Speed 4th rack travel in: 1360 Speed rpm: 0.00...1.50 LOW IDLE 1 Control Lever position degrees: 7...15 Testing: : 100 Speed rpm Minimum rack trave: 6.70 Speed man Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 350...500 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 10.70...10.80 rpm : 850 2nd speed Rack travel in m: 11.00..11.20 3rd speed rpm : 950 Rack travel in m: 10.80...11.00 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm hPa : -Pressure : 10.30...10.60 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 425 Rack travel in m: 10.50...10.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 600 Speed rpm Del.quantity cm3/: 165.0...171.0 1000 s: (162.0...174.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 700 Speed rpm : 1150 Del.quantity cm3/: 128.0...131.0 \*

1000 s: (125.0...134.0)

Spread cm3: 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 141.0...143.0 1000 s: (138.0...146.0) Spread cm3: 8.00 1000 s: (12.0)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1175...1185

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...170.0 1000 s: (146.0...174.0)

Remarks:
\* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : ENA 11,9 c Test sheet : 01.12.89 Edition : 17.2.89 Replaces : ISO-4113 Test oil Combination no. : 0 401 846 860 Injection pump Pump designation : PE6P12OA32ORS32OO EP type number : 0 411 826 766 Governor Governor design. : RQV250...1000PA808-1 : 0 421 813 660 Governer no. Customer-spec. information Customer : ENASA : 96 R1 BX Engine : 265.0 1st version kW Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. , C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 : 1 680 750 067 Test lines Outside diameter x Wall thickness

: 6.00x1.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

: (3.75...3.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 600 Rack travel in mm : 11.90...12.00 Del.quantity cm3/: 24.9...25.1 100 s: (24.6...25.4) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 250.0 Rack travel in mm : 3.3...3.7 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.00...1.40 travel mm rpm : 350 2nd speed : 2.10...2.60 travel mm rpm : 700 3rd speed : 4.70...5.30 travel mm rpm : 1055 4th speed : 7.90...8.10 travel mm rpm : 1145 5th speed : 9.00...9.40 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1070 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 600 Speed Aneroid pressure h: 1200

Prestroke mm

: 3.80...3.90

x Length mm

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 249.0...254.0)

cm3 : 5.00Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 50...58

Testina:

1st rack travel in: 10.90 Speed rpm : 1050...1060 2nd rack travel in: 4.00

rpm : 1130...1160 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

: 100 Speed rpm Speed Fig. 5.00 Minimum rack trave: 5.00 rpm : 250

Speed rpm : 250 Rack travel in mm : 3.30...3.70

CONSTANT REGULATION

rpm : 250...330 Speed

Aneroid/Altitude Compensator Test

1st version

Settina Speed

: 500 rpm hPa : 1200 Pressure

: 11.90...12.00 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 680

Rack travel in m: 11.30...11.40

3rd pressure hPa : 420

Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 900 Speed

Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0)

Aneroid pressure h: -

rpm\_ : 500

Del.quantity cm3/: 149.0...152.0

1000 s: (146.5...154.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 1050...1060 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 155.0...175.0 1000 s: (151.0...179.0)

Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet : ENA 11,9 e 01.12.89 Edition Replaces

: ISO-4113. Test oil

: 0 401 846 861 Combination no.

Injection pump

Pump designation : PE6P120A320RS3176-1

EP type number : 0 411 826 767

Governor

Governor design. : RQV250...1050PA808

: 0 421 813 553 Governer no.

Customer-spec. information Customer : ENASA

: 96 R1 AX Engine

: 250.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.80...3.90 : (3.75...3.95) Prestroke mm

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance  $+ - \dots : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.7)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm: 4.2...4.4 Del.quantity cm3/ : 2.5...3.1

100 s: (2.2...3.4)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm

rpm : 350 2nd speed

travel mm : 1.90...2.50

rpm : 700 3rd speed

: 4.50...5.10 travel mm

rpm : 1095 4th speed

: 8.00...8.20 travel mm

rpm : 1185 5th speed

: 9.00...9.40 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1110

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV, AT FULL LOAD STOP

1st version

rpm : 650 Speed Aneroid pressure h: 900

: 212.0...214.0 1000 : (209.0...217.0) Del.quantity

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 50...58

Testing:

1st rack travel in: 11.40 Speed rpm: 1090...1100 2nd rack travel in: 4.00

rpm : 1185...1215 Speed

4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

: 100 Speed man Minimum rack trave: 5.90 Speed rpm : 250 rpm

Rack travel in mm : 4.20...4.40

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

rpm : 500 hPa : 900 Speed rpm Pressure

Rack travel mm : 12.40...12.50

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.30

2nd pressure hPa : 390

Rack travel in m: 11.90...12.00

3rd pressure hPa : 160

Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1030 Del.quantity cm3/: 215.0...221.0 1000 s: (212.0...224.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 151.0...153.0 1000 s: (148.0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.40

rrm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 155.0...175.0 1000 s: (151.0...179.0)

Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet : ENA 11,9 d : 13.12.89 : 25.3.88 Edition Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 862

Injection pump

Pump designation : PE6P110A320RS3201 EP type number : 0 411 816 753

Governor

Governor design. : RQ250/1050PA218-1

: 0 421 801 406 Governer no.

Customer-spec. information : ENASA Customer

Engine : 96 A4 AU

: 150.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test Lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.25)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1030 1st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 12.6...12.8

100 s: (12.3...13.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600 Speed Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1030 Speed

: 126.0...128.0 Del.quantity

1000 : (123.0...131.0)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

rpm : 600 Speed Rack travel in mm: 16.0

Testing:

1st rack travel in: 11.10

Speed rpm : 1095...1110

2nd rack travel in: 4.00

rpm : 1140...1170 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm: 6.0

Testing:

Speed rpm : 100 Minimum rack trave: 7.50

Speed rpm: 250
Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 290...330

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.10

rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 143.0...163.0

1000 s: (139.0...167.0)

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Note remarks

Test sheet : STE 10,0 g : 20.10.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 912

Injection pump

Pump designation : PE6P110A720RS3243 : 0 411 816 770 EP type number

Governor

Governor design. : RQ300/1100PA412-4

: 0 421 801 496 Governer no.

Customer-spec. information Customer : STEYR

: WD615.68 Engine

1st version kW : 228.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. .. C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed Rack travel in mm: 3.9...4.1 Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.4)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 600 Speed

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1200

: 183.0...185.0 Del.quantity 1000 : (180.0...188.0)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.70

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

rpm : 1240...1270 Speed

4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 4.0 Testing: : 100 Speed rpm Minimum rack trave: 5.50 rpm : 300 Speed Rack travel in mm: 3.90...4.10 Rack travel in mm: 2.00 rpm : 350...390 Speed TORQUE CONTROL Dimension a mm Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 1200 Pressure : 13.70...13.80 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.00...10.20 2nd pressure hPa : 630 Rack travel in m: 12.90...13.00 3rd pressure hPa : 375 Rack travel in m: 10.90...11.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 700 Speed Del.quantity cm3/: 193.0...197.0 1000 s: (190.0...200.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

# BREAKAWAY

1st version 1mm rack travel less than

full load rack tr; 12.70 Speed rpm : 1145...1160

# STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 225.0...265.0 1000 s: (221.0...269.0)

#### LOW IDLE

Speed rpm: 300
Rack travel in mm: 3.90...4.10
Del.quantity cm3/: 15.0...21.0
1000 s: (12.0...24.0)
Spread cm3: 4.50
1000 s: (7.50)

## Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90 mm

MO5

Note remarks

: STE 10.0 h : 20.10.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 913

Injection pump

Pump designation : PE6P110A720RS3243 EP type number : 0 411 816 770

Governor

Governor design. : RQV250...1100PA413-5

Governer no. : 0 421 813 811

Customer-spec. information Customer : STEYR

Engine : WD615.68

1st version kW : 228.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm : 4.4...4.6 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.4)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed travel mm : 0.90...1.30

rpm : 350 2nd speed

: 1.70...2.30 travel mm

rpm : 700 3rd speed

: 4.40...5.00 travel mm

rpm : 1145 4th speed

: 8.30...8.50 travel mm

5th speed : 1250 rpm : 9.50...9.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200 Del.quantity : 183.0...185.0 1000 : (180.0...188.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control Lever

position degrees: 45...53

Testing:

1st rack travel in: 12.70 Speed rpm : 1140...1150 2nd rack travel in: 4.00

rpm : 1240...1270 Speed

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 10...18

Testing:

: 100 Speed rpm Minimum rack trave: 6.00 : 250 rpm

Rack travel in mm : 4.40...4.60

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1200 Pressure

Rack travel mm : 13.70...13.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 630

Rack travel in m: 12.90...13.00

3rd pressure hPa : 375

Rack travel in m: 10.90...11.10

START CUT-OUT

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 700

MO7

Del.quantity cm3/: 193.0...197.0

1000 s: (190.0...200.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 225.0...265.0

1000 s: (221.0...269.0)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Note remarks

Test sheet : ENA 12,9 a Edition : 01.12.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 846 915

Injection pump

Pump designation : PE6P12OA32ORS3244 EP type number : 0 411 826 788

Governor

Governor design. : RQV250...1050PA808-4

Governer no. : 0 421 813 821

Customer—spec. information Customer : ENASA

Engine : 98 R1 AX

1st version kW : 331.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40 : (3.25...3.45)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 28.7...28.9

100 s: (28.4...29.2)

Spread cm3: 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Del.quantity cm3/: 2.5...3.1

100 s: (2.2...3.4)

Spread cm3 : 0.8 100 s: (1.2)

(33 31 (112)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 travel mm : 1.00...1.40 2nd speed rpm : 350

travel mm : 1.90...2.50

3rd speed rpm : 700

travel mm : 4.50...5.10 4th speed rpm : 1095

travel mm : 8.00...8.20

5th speed rpm: 1185

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1110

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 750 Aneroid pressure h: 1200

: 287.0...289.0 1000 : (284.0...292.0) Del.guantity

cm3 : 5.00Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 51...59

Testina:

1st rack travel in: 12.10 Speed rpm : 1090...1100

2nd rack travel in: 4.00

rpm : 1185...1215 Speed

4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 13...21

Testing:

: 100 Speed rpm Minimum rack trave: 7.50 : 250 rom

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 250...430 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm Pressure hPa : 1200

: 13.10...13.20 Rack travel mm

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 10.90...11.30 2nd pressure hPa : 770

Rack travel in m: 12.60...12.70

3rd pressure hPa : 590

Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1030 Del.quantity cm3/: 275.0...281.0

1000 s: (272.0...284.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 217.0...219.0

1000 s: (214.0...222.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.10

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Speed rpm . 100 Del.quantity cm3/: 150.0...170.0 1000 s: (150.0...170.0)

Rack travel in mm : 19.50...21.00

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

**APPLICATION** 

Omnibus

: 3.70...3.80 : (3.65...3.85) Prestroke mm BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : DAF 11,7 i Test sheet : 24.11.89 Edition Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasina Combination no. : 0 401 846 917 Tolerance + - ... : 0.50 (0.75)Injection pump BASIC SETTING Pump designation : PE6P120A320RS3183 : 0 411 826 754 rpm: 850 EP type number 1st speed Governor Governor design. : RQV250...1000PA851-4 Rack travel in mm : 12.50...12.60 Governer no. : 0 421 813 828 Del.guantity cm3/: 20.9...21.1 Customer-spec. information 100 s: (20.6...21.4) Customer : DAF cm3 : 0.5Engine : WS 268 Spread 100 s: (0.9) 1st version kW : 268.0 Rated speed : 2000 rpm : 250.0 2nd speed Rack travel in mm: 6.5...6.7 TEST BENCH REQUIREMENTS Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Test oil cm3 : 0.8inlet temp. \_, C . : 38...42 Spread 100 s: (1.2) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL rpm : 250 Test nozzle holder 1st speed : 1.40...1.60 : 1 688 901 019 travel mm assembly rpm : 400 2nd speed : 3.20...3.60 Openina travel mm pressure, bar rpm : 800 : 207...210 3rd speed : 5.80...6.20 travel mm rpm : 1000 Orifice plate 4th speed : 7.90...8.10 : 0,8 travel mm diameter mm GUIDE SLEEVE POSITION : 1 680 750 067 Control-lever position Test lines Degree: -1 rpm : 1025 Outside diameter Speed Rack travel in mm : 15.20...17.80 x Wall thickness : 6.00x1.50x1000 x Length mm FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. rpm : 850 Speed Aneroid pressure h: 1000 per values Del.quantity : 209.0...214.0)

: 5.00

: (9.00)

cm3 1000

Spread

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

# RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 11.50

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1130...1160 4th rack travel in: 1250

rpm : 0.00...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 82...90

Testing:

: 100 Speed rpm Minimum rack trave: 7.50 : 250 rpm

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

nom : 275...385 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600 hPa : 1000 Pressure

Rack travel mm : 12.50...12.60

Measurement

1/min: 600 Speed

1st pressure hPa : -Rack travel in m: 11.00...11.20 2nd pressure hPa : 470

Rack travel in m: 12.10...12.20

3rd pressure hPa : 380

Rack travel in m: 11.40...11.60

START CUT-OUT

1/min: 200 (0) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 164.0...166.0 1000 s: (161.0...169.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.50

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 260.0...300.0

1000 s: (256.0...304.0)

LOW IDLE

rpm Speed

Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 14.0...20.0 1000 s: (11.0...23.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

M11

: 2.60...2.70 : (2.55...2.75) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 : VOL 12,2 e : 01.12.89 Test sheet Edition Replaces : 0-60-120-180-240-300 : ISO-4113 Phasina Test oil Tolerance + - ... : 0.50 (0.75)Combination no. : 0 401 846 919 Time to cyl. no. : 1 Injection pump Pump designation : PE6P120A320RS3118-7 : 0 411 826 790 BASIC SETTING EP type number Governor Governor design. : RQV250...950PA921-20 1st speed rpm: 700 : 0 421 813 838 Governer no. Rack travel in mm : 11.30...11.40 Customer-spec. information Del.quantity cm3/: 19.4...19.6 : VOLVO-TRUCK Customer 100 s: (19.1...19.9) Engine : TD122FTQ : 221.0 Spread cm3 : 0.51st version kW : 1900 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Rack travel in mm : 3.3...3.5 Del.quantity cm3/ : 1.8...2.3 Test oil inlet temp. ., C : 38...42 100 s: (1.5...2.5) cm3 : 0.5Overflow valve Spread 100 s: (0.7) : 1 417 413 025 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly rpm : 250 1st speed : 1.00...1.40 travel mm **Openina** : 207...210 2nd speed rpm : 350 pressure, bar : 2.20...2.80 travel mm Orifice plate 3rd speed rpm : 750 : 0,8 travel mm : 6.30...6.70 diameter mm rpm : 995 4th speed : 8.20...8.40 travel mm rpm : 1060 Test lines : 1 680 750 067 5th speed : 9.30...9.70 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X1.50X1000 Control-lever position x Lenath mm Degree: -1 rpm : 990 (A) Injection pump setting values Rack travel in mm : 15.20...17.80 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

Aneroid pressure h: 900

Speed

rpm : 700

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 194.0...196.0 Del.quantity 1000 : (191.0...199.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 60...68

Testing:

1st rack travel in: 10.30 rpm : 990...1000 Speed 2nd rack travel in: 4.00

rpm : 1035...1065 Speed

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 3...11

Testina:

: 100 Speed rpm Minimum rack trave: 4.80 Speed rpm

Rack travel in mm : 3.30...3.50

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 man hPa : 900 Pressure

Rack travel mm : 11.30...11.40

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 85

Rack travel in m: 9.20...9.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.30

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...280.0 1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 3.30...3.50
Del.quantity cm3/: 18.0...23.0

1000 s: (15.5...25.5)

cm3 : 5.00 Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet Edition : VOL 12,2 e1 : 01.12.89 Replaces

: ISO-4113 Test oil

Combination no. : 0 401 846 920

Injection pump

Pump designation : PE6P120A320RS3118-8 EP type number : 0 411 826 791

Governor

Governor design. : RQV250...950PA921-21

Governer no.

: 0 421 813 839

Customer-spec. information

: VOLVO-TRUCK Customer

: TD122FKQ Engine

: 254.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_ BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.60...2.70 Prestroke mm

: (2.55...2.75) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 3.3...3.5 Del.quantity cm3/: 1.8...2.3

100 s: (1.5...2.5) cm3 : 0.5

Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 1.00...1.40 travel mm

2nd speed

rpm : 350 : 2.20...2.80 travel mm

rpm : 750 3rd speed

: 6.30...6.70 travel mm

rpm : 995 4th speed

: 8.20...8.40 travel mm

5th speed rpm : 1060

: 9.30...9.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 990

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 900

: 234.5...236.5 Del.quantity 1000 : (231.5...239.5)

: 5.00 cm3 Spread : (9.00) 1000

RATED SPEED

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 12.20 Speed

rpm : 990...1000

2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1150

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 3...11

Testina:

Speed : 100 rpm Minimum rack trave: 4.80 : 250 Speed rom

Rack travel in mm: 3.30...3.50

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm hPa : 900 Pressure

: 13.20...13.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 85

Rack travel in m: 9.20...9.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.20

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 240.0...280.0

1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 3.30...3.50

Del.quantity cm3/: 18.0...23.0

1000 s: (15.5...25.5)

cm3 : 5.00Spread 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: KHD 12.8 a : 24.11.89 Test sheet Edition : 12.9.86 Replaces : ISO-4113 Test oil

Combination no. : 0 401 848 780

Injection pump

Pump designation: PE8P120A920/5LS3174 : 0 411 828 719 EP type number

Governor

Governor design. : RQV300...1150PA802

: 0 421 813 538 Governer no.

Customer-spec. information Customer : KHD

: BF8L513C Engine

: 265.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Rack travel in mm : 15.00...19.00 : 1-8-7-2-6-5-4-3 Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 16.6...16.8

100 s: (16.3...17.1)

cm3 : 0.6Spread

100 s: (1.0)

2nd speed rpm : 300.0 Rack travel in mm : 7.1...7.3 Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9)

cm3 : 0.9Spread 100 s: (1.3)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.00...1.40 travel mm

2nd speed 400 rom

: 2.20...2.80 : 550 travel mm

3rd speed rpm

: 3.50...4.10 travel mm

rpm : 1200 4th speed

: 8.20...8.40 travel mm

: 1285 5th speed rpm

: 9.00...9.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1220 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

Aneroid pressure h: 900

: 166.0...168.0 Del.quantity

1000 : (163.0...171.0)

cm3 : 6.00 Spread 1000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 50...58

Testina:

1st rack travel in: 12.20

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1310...1340 4th rack travel in: 1450

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 15...23

Testina:

Speed : 100 rpm Minimum rack trave: 8.80 Speed rpm: 300

Rack travel in mm : 7.10...7.30

CONSTANT REGULATION

rpm : 300...510 Speed

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 13.20...13.30

2nd speed rpm : 700

Rack travel in m: 13.50...13.70

Aneroid/Altitude

Compensator Test

1st version Setting

Speed rom

: 500 hPa : 900 Pressure

: 13.40...13.60 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 12.30...12.50 2nd pressure hPa : 500

Rack travel in m: 13.10...13.20

START CUT-OUT

Speed

1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 700 Del.quantity cm3/: 167.0...171.0 1000 s: (164.0...174.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.20

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 170.0...190.0

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Special-purpose vehicle

Note remarks

Test sheet : MB 14,7 d 7
Edition : 03.11.89
Replaces : 28.11.88
Test oil : ISO-4113

Combination no. : 0 401 848 800

Injection pump

Pump designation : PE8P110A320LS3842-1 EP type number : 0 411 818 716

EP type number Governor

Governor design.: RQV350..1050PA378-7

Governer no. : 0 421 813 714

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442

1st version kW : 213.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10

: (3.95...4.15)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ., .: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 12.70...12.80

Del.guantity cm3/: 12.4...12.6

100 s: (12.1...12.8)

Spread cm3: 0.4

100 s: (0.7)

2nd speed rpm : 350.0 Rack travel in mm : 8.0...8.3

Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3)

Spread cm3: 0.4

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.50...1.70 2nd speed rpm : 800

travel mm : 4.90...5.30

3rd speed rpm: 1100

travel mm : 7.90...8.50

4th speed rpm : 1150

travel mm : 8.90...9.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 750

Del.quantity : 124.0...126.0

1000 : (121.5...128.5)

cm3 : 4.00 Spread 1000 : (7.00)

RATED SPEED

1st version Control Lever

position degrees: 56...64

Testina:

1st rack travel in: 11.70

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

: 1140...1170 Speed rpm

4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 10...18

Testing:

Speed rpm Minimum rack trave: 9.50 : 350 Speed rpm

Rack travel in mm : 8.00...8.30

CONSTANT REGULATION

rpm : 350...450 Speed

START CUT-OUT

1/min: 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 1050 rpm

Del.quantity cm3/: 137.0...141.0 1000 s: (134.0...144.0)

Spread cm3 : 5.00

1000 s: (8.00)

: 1050 rpm

Del.quantity cm3/: 87.0...89.0 \*

1000 s: (84.0...92.0) cm3 : 6.00

Spread

1000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

\* = Set at reduced-delivery stop.

M19

Note remarks

Test sheet : BAO 21,2 b1 Edition : 02.10.89

Replaces

Test oil : ISO-4113

: 0 401 848 807 Combination no.

Injection pump

Pump designation: PE8P130A520/4RS3126

: 0 411 838 707 EP type number

Governor

Governor design.: RQV400...750PA934-1

: 0 421 813 817 Governer no.

Customer-spec. information : BAUDOUIN Customer

: 8P15 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 2- 4- 5- 6- 3-7- 8 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 9.30...9.40

Del.quantity cm3/: 19.2...19.5

100 s: (18.8...19.8)

cm3 : 0.6Spread

100 s: (1.0)

rpm : 400.02nd speed

Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 2.3...2.9

100 s: (1.9...3.3)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 400 1st speed

: 0.90...1.10 travel mm

2nd speed : 475 rpm

: 1.90...2.10 travel mm

3rd speed rpm : 600

: 1.90...2.10 travel mm

rpm : 750 4th speed

: 5.00...6.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 192.0...195.0 Del.quantity 1000 : (188.5...198.5)

cm3 : 6.00

Spread

1000 : (10.00)

RATED SPEED

1st version

Control lever

position degrees: 46...54

M<sub>2</sub>0

Testing:

1st rack travel in: 8.30 Speed rpm : 750...755

2nd rack travel in: 4.00 Speed rpm: 770...780

4th rack travel in: 900 rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 18...26

Testing:

Speed rpm : 100 Minimum rack trave: 6.50 : 400 Speed rpm

Rack travel in mm : 4.90...5.10

START CUT-OUT

1/min: 340 (360) Speed

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.30 Speed rpm : 750...755 Speed

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

**APPLICATION** 

Generator

#### Note remarks

: KHD 16,0 d4 Test sheet : 02.10.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 849 730

Injection pump

Pump designation : PE10P110A920/5LS3164

EP type number : 0 411 819 708

Governor

Governor design. : RQV300...1075PA821

: D 421 813 562 Governer no.

Customer-spec. information Customer : KHD

Engine : BF10L513

1st version kW : 250.0 : 2150 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 10- 9- 4- 3- 6-Firing order 5-8-7-2

: 0-27-72-99-144-171-Phasing

216-243-288-315

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

rpm: 1075 1st speed

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 12.4...12.6

100 s: (12.1...12.9)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 300.0 Rack travel in mm : 7.0...7.2 Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 1.00...1.40 travel mm

rpm : 450 2nd speed : 2.90...3.40 travel mm

3rd speed rpm : 800

: 5.00...5.50 travel mm rpm : 1100 4th speed

travel mm : 8.00...8.20

rpm : 1200 5th speed

: 9.10...9.50 travel mm

## GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1075 Aneroid pressure h: 750

Del.quantity : 124.0...129.0)

cm3 : 4.00 1000 : (7.50) Spread

RATED SPEED

1st version Control lever

position degrees: 50...58

Testing:

1st rack travel in: 10.20

rpm : 1105...1115 Speed

2nd rack travel in: 4.00

Speed rpm: 1200...1230 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 14...22

Testing:

: 100 Speed rom Minimum rack trave: 8.50 : 300 Speed rom

Rack travel in mm : 7.00...7.20

CONSTANT REGULATION

rpm : 300...440 Speed

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 650

Rack travel in m: 11.40...11.50

2nd speed rpm : 1075

Rack travel in m: 11.20...11.30 3rd speed rpm : 940

Rack travel in m: 11.30...11.40

Aneroid/Altitude

Compensator Test

1st version Setting

Speed rpm : 500 hPa : 750 Pressure

Rack travel mm : 11.40...11.50

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 11.10...11.20 2nd pressure hPa : 400

Rack travel in m: 11.30...11.40

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750

rpm : 650 Speed

Del.quantity cm3/: 128.0...132.0 1000 s: (125.0...135.0)

Aneroid pressure h: -

rpm : 450 Speed

Del.quantity cm3/: 112.0...116.0 1000 s: (110.0...118.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1105...1115 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.guantity cm3/: 135.0...165.0

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

: MAN 18,2 f Test sheet : 02.10.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 849 744

Injection pump

Pump designation: PE10P120A520/4LS3849

EP type number : 0 411 829 708

Governor

Governor design. : RQ750PA663-7 : 0 421 801 331 Governer no.

Customer-spec. information Customer : MAN

: D2840 LE Engine

1st version kW : 405.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp., C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.20...4.30 Prestroke mm

: (4.15...4.35)

Rack travel in mm : 9.00...12.00 8- 7 Firing order

: 10- 9- 4- 1- - 6- 3- 5-

: 0-45-72-117-144-189-216-261-288-333 Phasing

Tolerance + - ., .: 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 23.6...23.8

100 s: (23.3...24.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 4.5...4.9 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 236.0...238.0 Del.quantity

1000 : (233.0...241.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 11.30

rpm : 750...755 Speed 2nd rack travel in: 4.00

rpm : 790...803 Speed

4th rack travel in: 950

rpm : 0.00...1.00 Speed

STARTING FUEL DELIVERY

Speed

rpm

: 100

Remarks:

: MAN-NR. 2-7975

APPLICATION

Generator set

Note remarks

: MAN 18,2 g Test sheet : 09.11.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 849 746

Injection pump

Pump designation : PE10P120A520/4LS3855

EP type number : 0 411 829 709

Governor

Governor design. : RQV300...1000PA838 Governer no. : 0 421 813 585

Customer-spec. information Customer : MAN

: D2840LF/460 Engine

: 338.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.90...4.00

: (3.85...4.05)

Rack travel in mm : 9.00...12.00 Firing order : 10- 9- 4- 1-- 6- 3- 5-

: 0-45-72-117-144-189-216-261-288-333 Phasing

Tolerance + -, :: 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 6.0...6.2 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.00...1.40 travel mm

2nd speed rpm : 500 travel mm : 3.10...3.50

rpm : 850 3rd speed

: 6.60...6.90 travel mm

rpm : 1000 4th speed

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1003

Del.quantity : 204.0...206.0 1000 : (201.0...209.0) : 5.00 cm3Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 49...57 Testing: 1st rack travel in: 10.30 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1115...1145 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 13...21 Testing: Speed : 100 rom Minimum rack trave: 7.60 : 300 rpm Rack travel in mm : 6.00...6.20 CONSTANT REGULATION rpm : 335...445 Speed Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm Pressure hPa : 1000 : 11.30...11.40 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.20 2nd pressure hPa : 380 Rack travel in m: 10.40...10.50 3rd pressure hPa : 500 Rack travel in m: 10.90...11.10 START CUT-OUT

1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

Speed Speed Speed Speed Spread

Aneroid pressure h: rpm : 500 Del.quantity cm3/: 144.0...146.0 1000 s: (141.0...149.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.30 rpm : 1040...1050 STARTING FUEL DELIVERY rpm : 100 bel.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0) LOW IDLE rpm : 300 Rack travel in mm : 6.00...6.20 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) cm3 : 8.00 1000 s: (12.00) Remarks: : MAN-NR. 2-7779

1st version

Speed

M27

Note remarks

: MAN 18,2 f1 Test sheet Edition : 02.01.90

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 849 748

Injection pump

Pump designation: PE10P120A520/4LS3849

: 0 411 829 708 EP type number

Governor

Governor design. : RQ750PA947 Governer no. : 0 421 801 513

Customer-spec, information Customer : MAN

: D2840 LE Engine

: 352.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30 : (4.15...4.35)

Rack travel in mm : 9.00...12.00

: 10- 9- 4- 1- 8-- 6- 3- 5- 2 7 Firing order

: 0-45-72-117-144-189-Phasing

216-261-288-333

Time to cyl. no. : 10

BASIC SETTING

1st speed rom: 700

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 30<u>0</u>.0 2nd speed

Rack travel in mm: 4.3...4.7 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 229.0...231.0 Del.quantity 1000 : (226.0...234.0) cm3 : 5.00

Spread

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 11.30

rpm : 750...755 Speed 2nd rack travel in: 4.00 rpm : 790...803 Speed

4th rack travel in: 950

rpm : 0.00...1.00Speed

Remarks:

: MAN-NR. 2-7975

# APPLICATION

Generator set

: STE 9,7 b 1 : 08.09.89 Test sheet Edition : 12.9.86 Replaces

: ISO-4113 Test oil

Combination no. : 0 401 856 700

Injection pump

Pump designation : PE6P110A721RS3101

EP type number : 0 411 816 725

Governor

Governor design. : RQ300/1200PA412 Governer no. : 0 421 801 172

Customer-spec. information Customer : STEYR

: WD615.67 Engine

1st version kW : 206.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. .. C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Note remarks

: 0-60-120-180-240-300 Phasing

Firing order : 1-5-3-6-2-4

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 16.2...16.4

100 s: (15.9...16.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

cm3 : 0.4Spread 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed Aneroid pressure h: 700

Del.quantity : 162.0...164.0 1000 : (159.0...167.0)

Spread

cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version

Setting point:

rpm : 600 Speed Rack travel in mm: 16.0

Testing:

1st rack travel in: 11.00 Speed rpm : 1245...1260

2nd rack travel in: 4.00

rpm : 1325...1355 Speed

NO2

4th rack travel in: 1450

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.0

Testing:

Speed : 100 rpm Minimum rack trave: 7.50 : 300 Speed rom

Rack travel in mm : 5.90...6.10

Rack travel in mm: 2.00

Speed rpm : 405...445

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

: 1200 1st speed rpm

Rack travel in m: 12.00...12.10

rpm : 600 2nd speed

Rack travel in m: 12.40...12.70

rpm : 985 3rd speed

Rack travel in m: 12.30...12.50

4th speed rpm : 1075

Rack travel in m: 12.20...12.40

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 700 Pressure

: 12.40...12.60 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 420

Rack travel in m: 11.50...11.60
3rd pressure hPa : 330
Rack travel in m: 10.20...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 : 700 Speed rpm

Del.quantity cm3/: 165.0...169.0 1000 s: (163.0...171.0)

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 120.0...122.0 1000 s: (117.0...125.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1245...1260 Speed

STARTING FUEL DELIVERY

: 100 rpm

Del.quantity cm3/: 205.0...235.0 1000 s: (201.0...239.0)

Rack travel in mm : 18.80...19.20

Remarks:

N<sub>0</sub>3

Note remarks

Test sheet : MB 21,9 s : 15.08.89 Edition : 12.9.86 Replaces : ISO-4113 Test oil

Combination no. : 0 401 870 704

Injection pump

Pump designation : PE12P120A320LS3836-1

EP type number : 0 411 820 718

Governor

Governor design. : RSV350...750POA824-6

Governer no. : 0 421 833 232

Customer-spec. information

: DAIMLER-BENZ Customer

Engine : OM 424 A

1st version kW : 348.0 : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

345

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.90...12.00

Del.guantity cm3/: 19.3...19.5

100 s: (19.0...19.8)

cm3 : 0.5Spread

100 s: (0.8)

rpm : 350.0 2nd speed

Rack travel in mm: 4.2...4.8 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.8Spread 100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 193.0...195.0 Del.quantity 1000 : (190.0...198.0)

: 5.00 cm3 Spread

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 27...35

Testing:

1st rack travel in: 10.90 rpm : 750...755 Speed 2nd rack travel in: 4.00 rpm : 775...788 Speed

4th rack travel in: 900

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 8...16

Setting point w/out bumper spring

Speed rpm : 350 Rack travel in mm : 4.5

Testing:

Speed rpm: 100
Minimum rack trave: 17.50
Speed rpm: 350
Rack travel in mm: 4.20...4.80

SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.90 Speed rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...190.0 1000 s: (166.0...194.0)

Remarks:

Observe VDT-I-420/120

**APPLICATION** 

Generator

Note remarks

: DAF 8,3 o11 Test sheet : 20.06.89 Edition : 21.4.89 Replaces Test oil : ISO-4113

Combination no. : 0 401 876 316

Injection pump

Pump designation : PE6P100A720RS447 : 0 411 806 191 EP type number

Governor

: RSV250...1200P5A509-Governor design.

: 0 421 833 199 Governer no.

Customer-spec. information Customer : DAF

: DHT 825 Engine

: 162.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.30 (0.75)

BASTC SETTING

rpm : 10001st speed

Rack travel in mm : 11.40...11.50

Del.guantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 0.8...1.2

100 s: (0.5...1.4) cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 700

Del.quantity : 178.5...122.5)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 58...66

Testing:

1st rack travel in: 10.40 Speed rpm : 1240...1250

2nd rack travel in: 4.00

rpm : 1300...1330 Speed

3rd rack travel in: 4.00 rpm : 1325...1355 Speed 4th rack travel in: 1530 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 22...30 Setting point w/out bumper spring : 250 rpm Rack travel in mm: 4.8 : 250 Speed rpm Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00 : 540...640 Speed rom TORQUE CONTROL 1st speed rpm : 1000 Rack travel in m: 11.60...11.70 2nd speed rpm : 400 Rack travel in m: 11.60...11.80 3rd speed rpm : 300 Rack travel in m: 11.90...12.40 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 700 Pressure : 11.40...11.50 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.40...10.60 2nd pressure hPa : 315 Rack travel in m: 11.10...11.20 3rd pressure hPa : 225 Rack travel in m: 10.50...10.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600

Torque control curve - 1st version

Del.quantity cm3/: 92.5...96.5 1000 s: (90.0...99.0)

#### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.40 rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.20...5.40 Del.quantity cm3/ : 8.0...12.0 1000 s: (5.5...14.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

Note remarks

Test sheet : VOL 7,1 c
Edition : 15.08.89
Replaces : 24.2.89
Test oil : ISO-4113

Combination no. : 0 401 876 321

Injection pump

Pump designation : PE6P110A320RS497 EP type number : 0 411 816 165

Governor

Governor design. : RSV200...1200P1A374-

1

Governer no. : 0 421 833 204

Customer—spec. information Customer : VOLVO

Engine : TD71A

TEST BENCH REQUIREMENTS

Test oil

inlet temp., C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina (

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \dots : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 11.6...11.8

100 s: (11.3...12.1)

Spread cm3: 0.4

100 s: (0.7)

2nd speed rpm : 200.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 1.6...2.2

100 s: (-)

Spread cm3 : 0.3 100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700 Aneroid pressure h: 900

Del.quantity : 116.0...118.0 1000 : (113.0...121.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 51...59

Testing:

1st rack travel in: 10.80 Speed rpm : 1210...1220

2nd rack travel in: 4.00

Speed rpm : 1240...1270

4th rack travel in: 1410

rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring : 200 Speed rpm Rack travel in mm: 5.0 Speed rpm : 200
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 280...340 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 hPa : 900 Pressure : 11.80...11.90 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.80...10.00 2nd pressure hPa : 675 Rack travel in m: 11.60...11.70 3rd pressure hPa : 200 Rack travel in m: 10.10...10.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 700 Speed Del.quantity cm3/: 82.0...85.0 1000 s: (79.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 Speed rpm : 1210...1220 STARTING FUEL DELIVERY : 100 Speed rpm

Del.quantity cm3/: 195.0...225.0

Rack travel in mm : 20.00...21.00

1000 s: (191.0...229.0)

Speed rpm : 200
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...22.0
Spread cm3 : 3.00 1000 s: (6.00) Remarks: Delivery-valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90

LOW IDLE

Note remarks

: VOL 7,1 c 1 : 02.10.89 Test sheet Edition : 9.12.88 Replaces Test oil : ISO-4113

Combination no. : 0 401 876 322

Injection pump

Pump designation : PE6P110A320RS497 : 0 411 816 165 EP type number

Governor

Governor design. : RSV200...1200P1A374-

: 0 421 833 205 Governer no.

Customer-spec. information ' : VOLVO Customer

: TJD71A Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. .. C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina .

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 11.6...11.8

100 s: (11.3...12.1)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 200.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 1.6...2.2

100 s: (-) cm3 : 0.3Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

FLEL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

: 116.0...118.0 Del.quantity

1000 : (113.0...121.0)

cm3 : 4.00 1000 : (7.50) Spread

RATED SPEED

1st version Control lever

position degrees: 54...62

Testina:

1st rack travel in: 10.70

Speed rpm : 1240...1250 2nd rack travel in: 4.00

Speed rpm : 1290...1320 4th rack travel in: 1420

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 13...21

Setting point w/out bumper spring

: 200 Speed rpm Rack travel in mm: 4.8 : 200 Speed rpm

Rack travel in mm: 4.70...4.90

Rack travel in mm : 2.00 : 280...340 Speed rom

Aneroid/Altitude Compensator Test

1st version Settina

: 500 Speed rpm : 900 Pressure hPa

: 11.70...11.80 Rack travel mm

Measurement

1/min: 500 Speed

Rack travel in m: 8.80...9.00

2nd pressure hPa : 800

Rack travel in m: 11.60...11.70 3rd pressure hPa : 270

Rack travel in m: 8.90...9.30

FUEL DELIVERY CHARACTERISTICS

1st version

: 700 Speed mqn

Del.quantity cm3/: 66.0...68.0

1000 s: (63.0...71.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.70

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 185.0...215.0 Rack travel in mm : 20.00...21.00

LOW IDLE

: 200 Speed rpm

Rack travel in mm : 5.20...5.40

Del.quantity cm3/: 16.0...22.0 Spread cm3: 3.00 1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.
Permissible alteration from 2.20...2.90

Note remarks

: ENA 10,1 f Test sheet : 13.12.89 Edition : 24.2.89 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 332

Injection pump

Pump designation: PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

Governer no. : 0 421 833 273

Customer-spec. information Customer : ENASA

: 9105.42.25.21 Engine

1st version kW : 113.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 750 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.3...11.5

100 s: (11.1...11.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4) cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 750 : 113.0...115.0 Del.quantity 1000 : (111.0...117.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 34...42

Testing:

1st rack travel in: 10.90 Speed rpm : 790...800 2nd rack travel in: 4.00 rpm : 815...845 Speed

3rd rack travel in: 4.00 Speed rpm: 815...845 4th rack travel in: 1000 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testing: : 100 Speed rpm Minimum rack trave: 19.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10 Rack travel in mm: 2.00 : 330...390 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 750 1st speed Rack travel in m: 11.90...12.00 rpm : 450 2nd speed Rack travel in m: 11.90...12.00 3rd speed rpm : 300 Rack travel in m: 13.20...13.80 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.90 rpm : 790...800 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

APPLICATION

Generator set

#### Note remarks

Test sheet Edition : ENA 10,1f16

: 02,10,89 Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 332P

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RSV250...1000P1A532

: 0 421 833 273 Governer no.

Customer-spec. information Customer : ENASA

: 9105.07 Engine

1st version kW : 105.0 : 2000 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_, C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 14.0...14.2

100 s: (13.8...14.4)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 7.9...8.1 Del.quantity cm3/: 1.8...2.2 100 s: (1.5...2.4)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 140.5...142.5 Del.quantity

1000 : (138.5...144.5) cm3 : 3.50 1000 : (6.00) Spread

#### RATED SPEED

1st version Control Lever

position degrees: 38...46

Testing:

1st rack travel in: 12.30 rpm : 735...745 Speed 2nd rack travel in: 4.00

rpm : 780...810 Speed

3rd rack travel in: 4.00 Speed rpm: 790...820 4th rack travel in: 1000 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring rpm : 250 Rack travel in mm: 5.5 Testina: : 100 Speed rpm Minimum rack trave: 19.50 : 250 Speed rpm Rack travel in mm : 5.90...6.10 Rack travel in mm: 2.00 Speed rpm : 330...390 TORQUE CONTROL Torque control curve - 1st version rpm : 700 1st speed Rack travel in m: 13.30...13.40 rpm : 450 2nd speed Rack travel in m: 13.30...13.40 d speed rpm : 290 3rd speed Rack travel in m: 14.60...15.20 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.30 rpm : 735...745 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

APPLICATION

Generator set

Note remarks

Test sheet : ENA 11,9 g : 09.11.89 Edition Replaces : 16.6.88 Test oil : ISO-4113

Combination no. : 0 401 876 333

Injection pump

Pump designation : PE6P120A320RS257 EP type number : 0 411 826 075

Governor

Governor design. : RSV250...1100P0A533

Governer no. : 0 421 833 274

Customer-spec. information Customer : ENASA

: 96 T1A0 Engine

1st version kW : 213.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95) Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \frac{1}{2}$  : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 10.10...10.20

Del.quantity cm3/: 18.6...18.8

100 s: (18.3...19.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

Del.quantity : 186.0...188.0

1000 : (183.0...191.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testina:

1st rack travel in: 9.10

Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 3rd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1350 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.3 Testina: : 100 Speed rom Minimum rack trave: 19.50 rpm : 250 Rack travel in mm : 5.70...5.90 Rack travel in mm : 2.00 : 330...390 Speed rpm TORQUE CONTROL Torque control curve – 1st version 1st speed rpm : 1050 Rack travel in m: 10.00...10.20 ad speed rpm : 450 2nd speed Rack travel in m: 10.10...10.20 3rd speed rpm : 300 Rack travel in m: 11.30...11.90 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.10 rpm : 1140...1150 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Rack travel in mm : 19.50...21.00 Remarks: APPLICATION Ship

Note remarks

Test sheet : DAF 11,7 g Edition : 09.11.89 : 30.9.88 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 336

Injection pump

Pump designation : PE6P120A320RS415-1 EP type number : 0 411 826 123

Governor

Governor design. : RSV250...1050P5A539

Governer no. : 0 421 833 299

Customer-spec. information Customer : DAF

Engine : KT 191

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 16.1...16.3

100 s: (15.8...16.6)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm: 6.4...6.8 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3) Spread

cm3 : 0.8 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650 Aneroid pressure h: 700

Del.quantity

: 161.0...163.0 1000 : (158.0...166.0) cm3 : 5.00 1000 : (9.00)

Spread

RATED SPEED

1st version Control lever

position degrees: 46...54

Testing:

1st rack travel in: 9.20

Speed rpm : 1085...1095

2nd rack travel in: 4.00

rpm : 1125...1155 Speed

3rd rack travel in: 4.00

rpm : 1150...1180 Speed 4th rack travel in: 1320

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 20...28

Setting point w/out bumper spring Speed rpm : 250

Rack travel in mm: 5.8

Testina:

: 100 Speed rpm : 250 Speed rpm

Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00

: 630...730 Speed rom

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1040 Rack travel in m: 10.20...10.40

: 650 rpm 2nd speed

Rack travel in m: 11.10...11.20

rpm : 805 3rd speed

Rack travel in m: 10.80...11.00 th speed rpm : 850

4th speed

Rack travel in m: 10.50...10.70

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 600 Pressure hPa : 700

: 10.80...10.90 Rack travel mm

Measurement

 $1/\min: 600$ Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.70 2nd pressure hPa : 310 Rack travel in m: 10.40...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 rpm : 1040

Del.quantity cm3/: 160.0...164.0 1000 s: (157.0...167.0)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 130.0...132.0

1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.20

rpm : 1085...1095 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 300.0...340.0 1000 s: (296.0...344.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.20...6.40

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

: IFS 23,1 d Test sheet : 15.08.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 337

Injection pump

Pump designation : PE6P130A320S521 EP type number : 0 411 836 044

Governor

Governor design: : RSV350...1500POA524

Governer no. : 0 421 833 256

Customer-spec. information Customer : ISOTTA

: ID38 SS-6V Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. , C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm : (3.45...3.65)

Rack travel in mm : 18.00...21.00

Firing order : 1-2-3-4-5-6

: 0-45-120-165-240-285 Phasing

Time to cyl. no. : 1

BASIC SETTING

rpm: 1500 1st speed

Rack travel in mm: 13.40...13.50

Del.quantity cm3/: 25.7...26.0

100 s: (25.3...26.3)

cm3 : 0.6Spread

100 s: (1.0)

rpm : 500.0 2nd speed Rack travel in mm: 8.2...8.4 Del.quantity cm3/: 9.6...10.2

100 s: (9.2...10.6) cm3 : 1.0 Spread

100 s: (1.4) rpm : 500 3rd speed Rack travel in mm: 7.80 Del.quantity cm3/: 80.0

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1500 Speed

Aneroid pressure h: 900 Del.quantity : 257.0...260.0 1000 : (253.5...263.5)

: 6.00 cm3 Spread

1000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 42...50

Testina:

1st rack travel in: 12.40 rpm : 1540...1550 Speed 2nd rack travel in: 4.00 rpm : 1650...1680 Speed 3rd rack travel in: 4.00 rpm : 1665...1695 Speed 4th rack travel in: 1750 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 68...76 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 6.4 rpm : 350 Speed Rack travel in mm : 6.80...7.00 Rack travel in mm : 2.00 rpm : 525...585 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1500 Rack travel in m: 13.40...13.50 2nd speed rpm : 600 Rack travel in m: 13.40...13.60 3rd speed rpm : 400 Rack travel in m: 14.60...15.20 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 900 Pressure : 13.40...13.50 Rack travel mm Measurement Speed 1/min: 600 Rack travel in m: 12.40...12.50 2nd pressure hPa : 300 Rack travel in m: 12.80...12.90 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 215.0...218.0 1000 s: (211.5...221.5) **BREAKAWAY** 

Speed rpm : 1540...1550 LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.70...7.10
Del.quantity cm3/ : 20.0...26.0 \*
 1000 s: (-)

Remarks:

\* = Element disconnected at idle for cylinders 2, 4 and 6.

1st version

1mm rack travel less than

full load rack tr: 12.40

Note remarks

Test sheet : ENA 10,1 g Edition : 01.12.89

Replaces

: ISO-4113 Test oil

Combination no. : 0 401 876 339

Injection pump

Pump designation : PE6P110A820LS513-1 EP type number : 0 411 816 177

Governor

: RSV250...1000P1A532-Governor design.

: 0 421 833 331 Governer no.

Customer-spec. information Customer : ENASA

Engine : 95T1B0.MR4

1st version kW : 176.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. ., C . : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3,20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 188.0...190.0 Del.quantity 1000 : (185.0...193.0)

: 4.00

Spread cm3 1000 : (7.50)

RATED SPEED

1st version

Control Lever

position degrees: 36...44

Testing:

1st rack travel in: 12.20

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rpm : 1085...1115 Speed 3rd rack travel in: 4.00 rpm : 1085...1115 Speed 4th rack travel in: 1250 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring : 250 Speed rpm Rack travel in mm: 5.5 Testing: : 100 Speed rpm Minimum rack trave: 19.50 : 250 Speed rpm Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 rpm : 330...390 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 13.20...13.30 2nd speed rpm : 450 Rack travel in m: 13.20...13.30 3rd speed rpm : 300 Rack travel in m: 14.40...15.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.20 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0) Rack travel in mm : 19.00...21.00 LOW IDLE : 250 Speed man Rack travel in mm : 5.90...6.10 Remarks: APPLICATION

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Note remarks

Test sheet : PEN 12,1 b : 11.11.88 Edition : 9.3.87 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 756

Injection pump

Pump designation : PE6P120A320RS3189 : 0 411 826 759 EP type number

Governor

Governor design. : RSV650...750P4/421-3

: 0 421 833 252 Governer no.

Customer-spec. information

: VOLVO-PENTA Customer

Engine : TD121GG

: 199.0 1st version kW Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp., C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.60...2.70 : (2.55...2.75) Prestroke mm

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ... : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 700

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 24.1...24.3

100 s: (23.8...24.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 650.0 2nd speed

Rack travel in mm : 3.3...3.5 Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.7)

cm3 : 0.5 Spread 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.70

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Del.quantity : 241.0...243.0

1000 : (238.0...246.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 10.40

Speed rpm : 750...755 2nd rack travel in: 4.00 Speed rpm : 791...804 4th rack travel in: 950 rpm : 0.30...1.70Speed

LOW IDLE 1 Control Lever

position degrees: 35...43

Setting point w/out bumper spring

rpm : 650 Speed Rack travel in mm: 3.4 Speed rpm : 650
Rack travel in mm : 3.30...3.50
Rack travel in mm : 2.00

rpm : 630...690 Speed

SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.40 speed rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 480.0...520.0 Rack travel in mm : 20.00...21.00

Remarks:

Note remarks

Test sheet : ENA 11,9 i Edition : 13.12.89

Replaces : -

Test oil : ISO-4113

Combination no. : 0 401 876 760

Injection pump

Pump designation : PE6P120A320RS3176-1

EP type number : 0 411 826 767

Governor

Governor design. : RSV250...1100P0A533

Governer no. : 0 421 833 274

Customer—spec. information Customer : ENASA

Engine : 96 W1 A0

1st version kW : 250.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \_ C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90 : (3.75...3.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \dots : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 24.7...24.9

100 s: (24.4...25.2)

Spread cm3: 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.1...4.3 Del.quantity cm3/ : 2.5...3.1

100 s: (2.2...3.4)

Spread cm3: 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

ver position Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1000

Del.quantity : 247.0...249.0

1000 : (244.0...252.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testina:

1st rack travel in: 12.60

rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 3rd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1350 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm: 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 250 Speed rom Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 : 340...400 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 13.60...13.70 2nd speed rpm : 450 Rack travel in m: 13.60...13.70 3rd speed rpm : 300 Rack travel in m: 14.80...15.40 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.60 rpm : 1140...1150 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0) Rack travel in mm : 19.50...21.00 Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm **APPLICATION** 

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